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QUARTERLY

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ECONOMY IN PUBLIC HEALTH

by EDGAR SYDENSTRICKER

ECONOMY in public health is a phrase which is given two entirely opposite meanings. In this respect, public health shares with many other fields the ambiguity which attaches to the word "economy." Some interpret economy to mean the reduction of appropriations (by federal, state, or local governments) for the support of specific public health procedures of proven value for no other reason than that appropriations for less vital purposes are being reduced. The other interpretation of economy calls for expenditure of appropriations to the end that the money should be used to the greatest possible advantage. The one is as surely false as the other is true. If economical appropriations are to be made, it is necessary to understand fully (1) the existing need for public health protection, and (2) the degree in which this protection actually can be afforded by effective public health administration and public health methods.

The questions of false and true economy in public health take on a national significance because of the Social Security Act of August 14, 1935. "For the first time," said Dr. E. L. Bishop in his presidential address at the 1935 meeting of the American Public Health Association, "the importance of public health protection as an element in national security has been fully recognized by expression of a national policy for the strengthening of state and local health agencies. Passage of the Social Security Act by the last Congress presents the public health profession of this country with the greatest opportunity to establish constructive programs of health service that has been given to any group in our history." In another connection in the same address, Dr. Bishop pointed out that, "The establishment of a national health policy through passage of the Social Security Act, together with the existence of at least the elementary facilities for the application of knowledge,

today places the public health profession of this country at the cross-roads of opportunity. If its fullest possibilities are to be realized, this turning point in our history must be met in the spirit of highest idealism."

Under the Social Security Act, authorization was made for federal appropriations totaling $13,800,000[1] for federal public health services and grants-in-aid to the states for their public health activities. But, since the Congress was balked in the closing hours of its last session, by the filibuster of one Senator, in its intention to appropriate money under this Act, the size of appropriations under the Act will come up again for consideration at the session which begins in January, 1936. The Act itself authorizes but does not make appropriations. It may become an acute issue because of the pressure to reduce federal expenditures generally along horizontal lines. In view of the general approval expressed for the public health provisions of the Act last summer, it may be assumed that the intended appropriations will be made and it is not unlikely that the increase in federal appropriations will be followed in many instances by increases in state and local appropriations for public health. This possibility raises the question also of how this additional money can be expended most effectively and therefore most economically.

I

The necessity for increased federal appropriations for public health was fully realized by the Committee on Economic Security, by the President and by the Congress, as evidenced in the Com-

[1] This total includes $8,000,000 for grants-in-aid to states through the United States Public Health Service, $3,800,000 through the Federal Children's Bureau for maternal and child health, and $2,000,000 to the Public Health Service for research and additional personnel. This is exclusive of the $2,850,000 authorized in the Act for crippled children, including services and facilities for children suffering from conditions which lead to crippling, and $1,500,000 for child welfare in predominantly rural areas, although the public health values, both direct and indirect, of these services are clear and unequivocal. Sound provisions for unemployment compensation and old-age security may be regarded as indirect measures for health maintenance, but the question of the soundness of the provisions for these purposes which were embodied in the Act is not germane to the subject under discussion here.

mittee's report, the President's message, and the action of the Congress itself. The members of the Committee's staff to whom the subject of "Risks to Economic Security Arising Out of Ill Health," was assigned, had proposed as a fundamental consideration that no program of dealing with these risks could be regarded in any sense as complete or effective without adequate provision of measures for the prevention of ill health. In presenting this view to the Committee, it was pointed out that the application of the sound principle of prevention in this instance should be viewed in the light of four broad considerations which may be stated briefly as follows:

(1) Although one-third of the burden of preventable illness and premature death has been lifted in progressive communities since modern public health procedures were introduced, there is recognized opportunity for continued progress and wider application. Only a fraction of the population has benefitted to the fullest extent from the application of existing knowledge of disease prevention through public health procedures of proven effectiveness.

(2) The policy of leaving to localities and states the entire responsibility for providing even minimal public health facilities and services has failed in large measure. Only 21 per cent (75 counties and 102 cities) of counties and cities have thus far developed a personnel and service which can be rated as even a satisfactory minimum for the population and the existing problems. Only 540 out of 2,500 rural counties have even a skeleton health administration.[2] Yet the federal government has a definite constitutional responsibility for the protection of all of the nation's population against disease or other

[2] As of December 31, 1934. The following figures are from the United States *Public Health Reports* for November 1, 1935, p. 1553:

Number of counties, townships, or districts having whole-time health services.

	Jan. 1 1931	Jan. 1 1932	Dec. 31 1932	Dec. 31 1933	Dec. 31 1934
Number	557	616	581	530	540
Increase or decrease		+59	−35	−51	+10

causes harmful to the public health. The responsibility of the federal government for national health is well established in the United States Public Health Service and in several other federal agencies such as the Children's Bureau, the Bureau of the Census, the Office of Education, the Food and Drug Administration, the Bureau of Home Economics, and the Bureau of Animal Industry.

(3) The precedent of federal aid to states for state health administration and local public health facilities has been established in various laws for grants-in-aid and in loans of technical personnel to states and localities.

(4) Public health has been demonstrated as a sound economic investment. Public health authorities estimate on good evidence that our annual national economic loss in wage-earnings and in other items incident to preventable sickness directly attributable to lack of reasonably efficient rural health service alone is over one billion dollars. On the other hand where reasonably effective health programs have been developed, it has been demonstrated that expenditures for carefully planned health programs executed by trained workers yield large dividends.

The necessity for federal aid in expanding existing health services throughout the country is further emphasized by the fact that the formerly inadequate appropriations by local, state, and national governments had been further reduced drastically in many localities during the depression. The experience of cities in 1934 showed that health budgets have been reduced on the average about 20 per cent since 1931, reductions varying from one and two per cent to as high as 50 per cent. Where this reduction amounted to 30 per cent or more, practically complete break-downs of the public health protective facilities have resulted. The proposals for annual appropriations under the Social Security Act were purposely made modest for the reason that the Committee's staff and its advisers recognized the necessity for slow and gradual, rather than hurried or sudden, expansion. Sufficient trained personnel, for example,

are not available to warrant the expenditure immediately of larger sums. In the interest of sound economy, the amount proposed for additional direct health work is therefore almost infinitesimally small in comparison with the tremendous sums which have been expended for more indirect methods of health conservation through relief, housing, and the like. Certainly the proposed public health expenditures are insignificant when compared with many other federal expenditures for purposes less vital to the well-being of the population.

It was anticipated by the Committee's staff that this proposed sum should not be curtailed by the kind of false economy already referred to. On the contrary, increasing appropriations on the part of the federal government for aiding the states and localities and providing health services were regarded as inevitable. If one may express a personal opinion or venture an estimate, I would say that within the next decade or so, federal appropriations for health services and health facilities should reach the sum of not less than 50 cents per capita and perhaps as much as $1.00 per capita, in addition to state and local funds. Even this—say a minimum of $65,000,000—would be a relatively small investment in so priceless a thing as improved physical and mental health of the people who compose the nation.

II

Each health officer and individual interested in health should exert every influence he possesses to encourage adequate appropriations on the part of federal, state, and local governments. It should be realized, however, that appropriations of public funds for public health place upon health authorities a very definite responsibility for the effective use of the money. This responsibility has not always been adequately discharged in the past. For example, many years ago Dr. Charles V. Chapin, in Providence, Rhode Island, showed that the disinfection and fumigation of

houses in which cases of communicable disease had resided was a useless expenditure of public funds. Yet, in spite of this, the practice of indiscriminate disinfection and fumigation was kept on, long after its worthlessness had been demonstrated. Over ten years ago, in an illuminating address on "Rendering Account in Public Health,"[3] Dr. W. H. Frost pointed out:

> As various lines of activity are suggested to him (the health officer) by contemporary practice or urged upon him by special propagandists it is his duty to consider what returns are to be expected from each one and to decide how much of his capital he will put into each one. Since his capital comes entirely from the public, it is reasonable to expect that he will be prepared to explain to the public his reasons for making each investment, and to give them some estimate of the returns which he expects. Nor can he consider it unreasonable if the public should wish to have an accounting from time to time, to know what returns are actually being received and how they check with the advance estimates which he has given them. Certainly any fiscal agent would expect to have his judgment thus checked and to gain or lose his clients' confidence in proportion as his estimates were verified or not.

The present writer, at about the same time, in an attempt to discuss methods of measuring results of public health work, observed that the necessity for rendering an account "is in line with the increasingly critical attitude on the part of sanitarians in appraising the effectiveness of their work." I venture to quote the following from an earlier paper:[4]

> As the objectives of a social program such as the improvement of public health become more clearly defined, and as the methods of carrying out a program are improved, the more rigid must be the standards and the more accurate must be the means by which we must measure the efficacy of the

[3] Frost, W. H.: Rendering Account in Public Health. *American Journal of Public Health*, May, 1925, xv, No. 5, pp. 394-398.

[4] Sydenstricker, Edgar: The Measurement of Public Health Work. Annual Report of the Milbank Memorial Fund for 1926.

> program and the efficiency of the methods. No longer can the mere "putting over" of a project be regarded as the final test of success; for while undoubtedly it is an essential step in the accomplishment of a specific project, the final criterion is the ultimate result—the prevention of a given disease, the lessening of sickness and death from specific and related causes, and the promotion of health to a discernible degree.

The necessity for the scientific evaluation of each specific public health procedure is greater now than ever before. This is true not merely because of the probability of increased appropriations for public health but also because a great deal of public health work has undergone a process of standardization. The more it becomes standardized, the more easily and, at the same time, the more rapidly can it be put into wider operation when the necessary financial support is available. If a given standard procedure is not a scientifically tested procedure, a definite and grave danger is involved. An uneconomical or ineffective procedure, for example, may, by the very process of standardization, be adopted by many communities with the result that its improvement or its eradication would be all the more difficult for no other reason than its routinized application on a large scale. The appraisal form, for example, which has been developed carefully through many years of earnest and hard work, has undoubtedly rendered a service of tremendous value. It is a "yardstick" method for measuring public health work. The yardsticks it contains have not always been altogether accurately calibrated, however. Such a statement does not in any way place any blame upon those who have devised the yardsticks since the yardsticks represent the best opinion and experience at the time. But unless the public health procedures such as are set forth in the appraisal form, or in textbooks on public health administration, or in standards set forth by official or nonofficial agencies, are continually put to the test of actual efficiency in accomplishing their specific objectives, we cannot be sure that

all of our present appropriations for public health are used to the best possible advantage. The Committee on Administrative Practice of the American Public Health Association has, itself, recognized these dangers inherent in the establishment of standards, and has periodically reviewed the standards. Unfortunately, they have not always had available data by which they could evaluate the accomplishments of a procedure as much as the extent of its application.

This is not idle nor destructively critical comment. By way of illustration, one may properly ask: What are the scientific bases or the actual experience upon which are based some of our public health standards? We call for eight visits of a public health nurse to each and every case of whooping cough. This standard, as is well known, is rarely measured up to and more than one health officer has asked himself the question: What evidence is there of prevention of mortality from or reduction in incidence of whooping cough by eight visits rather than by four or two or one? Or again, school medical examinations have become so wide-spread and so routinized that they involve a not inconsiderable portion of the health budget. The health officer properly may have reasonable doubts as to the efficacy of school medical examinations as they are now carried out in practice. And so the entire list of public health procedures might well be viewed in the light of a healthy skepticism, not for the purpose of tearing down what has been so carefully set up, but for the purpose of improving the procedure itself.

In the scheme of public health, therefore, it seems clear that this healthy skepticism should be met by providing facilities for scientific testing of most procedures now in operation and of each new procedure before it is put into operation on a wide scale, and of each standard by which the application of procedures is measured. A beginning has been made along these lines by some of the foundations interested in public health, by individual health officers here

and there who have the point of view which actuated Dr. Chapin for many years, and by the United States Public Health Service through the newly created Office of Studies of Public Health Methods as well as in the laboratories of the National Institute of Health.

Since the Federal Public Health Service and the Federal Children's Bureau are primarily charged with the responsibility (within certain prescribed limits) for allocating grants-in-aid to states, it is obviously necessary that these agencies should possess the facilities for the evaluation of the public health procedures for which the grants are to be made. The staff of the Committee on Economic Security had this function in mind when it proposed to the Committee that $2,000,000 additional should be appropriated to the Public Health Service for research and for additional personnel in order that the Service, through its own Division of Research, the National Institute of Health, and in cooperation with universities and other institutions, might undertake and encourage the task of testing public health methods. If this relatively modest sum of $2,000,000 is seriously curtailed by the policy of horizontal cuts in appropriations, without regard to the importance of the purposes for which the appropriations should be made, one of the primary objectives of true economy in public health work will be hampered. Doubtless other agencies including foundations, universities, and local health departments, will continue to contribute to the scientific evaluation of public health procedures but the leadership and aid of the federal health agencies are greatly needed.

III

Thus the public health profession and the Congress and the Administration have before them a problem of vital importance. It is a question of whether that type of false economy which has prevailed so long in federal expenditures for health shall be per-

sisted in, or whether true economy shall prevail at this time when, as Dr. Bishop has said, public health is "at the cross-roads of opportunity." The appropriations authorized in the Social Security Act are extremely modest. In the framing of this Act, careful consideration was given to the principles of true economy. The members of the staff of the Committee on Economic Security, to whom was assigned the general subject of health, estimated that not $14,000,000 but a minimum of $24,000,000 was needed to assist states and localities in providing even minimal health services of proven value. But in view of the lack of facilities and personnel and the time required to train personnel and provide facilities, the total amount proposed was scaled down by over 40 per cent in the interests of true economy. In other words, to use a phrase familiar in the making of budgets, there was no "padding" in the final estimate. A further reduction in the appropriations authorized would seriously curtail the very modest and practical program proposed. Furthermore, it was intended by the Committee's staff and its advisers that this program should be limited to federal aid for public health procedures of *proven* value. It was anticipated that larger appropriations would be made in succeeding years, as new procedures are found to be effective by scientific tests and by experience.

Economy in public health, therefore, demands adequate appropriations for providing health services of proven effectiveness in every locality according to its needs. It places a definite responsibility upon health authorities for efficient administration of funds appropriated. Efficient administration requires competent personnel for carrying on such public health procedures as have been proven to be effective and adequate facilities for discovering, through research and experimentation, new procedures as well as improving existing ones by scientific methods.

ADMINSTRATIVE AIDS TO RURAL HEALTH SERVICE[1]

by C. L. SCAMMAN, M.D.[2]

ALL of us are interested either directly or indirectly in the problems of public health administration. The chief concern of this paper is to outline methods and means of improving the quality of local health service and the administrative tools by which this may be accomplished.

[3]In at least three-fourths of the states of the Union, the county is the important unit of local government and our discussion is concerned chiefly with rural health service organized in county units, though the methods described are equally applicable to town unions, districts formed by combining small counties, or other units, even small cities. In 1934, there were 528 county health organizations in thirty-four states on a full-time basis with professionally trained personnel. The usual staff of a county health department consists of a medical health officer, one or more nurses, one or more sanitary inspectors, and one or more office assistants. The relationship of the state department of health to the county health department is fixed in each state by law and may be advisory or supervisory. The state usually pays a share of the cost of the local health service, in amounts varying from an almost insignificant percentage to more than half. Although the question of authority is at times important, the best results, most state health officers believe, occur where there is a fine spirit of cooperation and official and financial partnership between the state and local health authorities and a program of procedure agreeable to both is voluntarily adopted. In the smaller state

[1] Presented before a joint session of the Canadian Public Health Association with the Ontario Health Officers' Association and the Canadian Social Hygiene Council, Toronto, June 3, 1935, and republished by permission of the author and the *Canadian Public Health Journal*, August, 1935, pp. 367-372.

[2] Director, Division of Public Health, The Commonwealth Fund, New York.

[3] U. S. Public Health Service: Public Health Bulletin No. 184 (Revised); Health Departments of States and Provinces of the United States and Canada.

health organizations responsibility for advising or directing local health service rests directly upon the state health officer. When it is possible for a state department to have four or five basic divisions, each with a competent director, the responsibility for supervising local health services is delegated to one. Sixteen states at the present time have bureaus or divisions of county health work with a director in charge. In several states when the development of county health departments has made substantial headway, the counties are grouped into districts for administrative supervision. The district health officer plan, especially in the northeastern section of the country, until recently has been used primarily as an emergency arm of the state health department, concerned generally with the investigation and control of epidemic disease.

As has already been said, in 1934 there were in thirty-four states in the United States 528 full-time county health departments. In 1915, but fourteen of these were in existence following the establishment of the first county health department in 1911 in Yakima County, Washington. Beginning in 1915, several developments took place, all of which had a very definite effect in improving the procedures and quality of local health service. It is our purpose to outline briefly some of these implements which have been of such distinct value in this development.

Every state health officer faced with the problem of the supervision of from ten to thirty local health services, on a county or district basis, will agree that the following facts should be available with regard to each health jurisdiction:

> The nature of the district under consideration with regard to area, number, density, age, and racial characteristics of the population, topography, climate, industry, and disease experience, as well as any special problem peculiar to this particular territory. In those instances in which there already exists a local health organization, he should know the age of the program.
>
> The problems of personnel and their qualifications.

The scope and provision of the state health laws and regulations relating to such an area.

Exact knowledge of the extent and sources of financial support.

THE APPRAISAL FORM FOR RURAL HEALTH WORK

With these facts determined, thought should be given to providing for local health service periodic administrative and technical guidance as well as assistance in the handling of special problems by the state authority. In this connection it would seem desirable to have the essential elements of local health practice reasonably well standardized and set up in the form of a manual of administrative procedures. Similarly, a record system should be planned which would make possible comparative studies of work in one local health department with that of another. It is my opinion that regular surveys and appraisals of local health jurisdiction at regular intervals by the staff of the state health department are essential to the maintenance of balanced program and improved performance.

In 1915, Chapin set up a percentage scheme for rating his own health activities which, as he said, indicated by means of figures their relative values. In 1925, the city appraisal form was set up by a committee of the American Public Health Association; and, in 1927, a parallel form of appraisal standards was set up by the same association for rural areas. In both instances the standards are based on actual accomplishment by a number of city and county departments. The ten activities scored are (1) vital statistics, (2) communicable disease, (3) venereal disease, (4) tuberculosis, (5) maternity hygiene, (6) infant hygiene, (7) preschool hygiene, (8) school hygiene, (9) general sanitation, and (10) control of food and milk, representing in total a thousand points. For example, under communicable disease control the following items are considered: reporting, diagnostic service, case investiga-

tion and recording, health department supervision, immunization, laboratory service, and community education—representing a total score for the communicable disease bracket of 100 points. The value of the ratings against the different functional activities is perhaps only an approximation, but it represents group judgment and is far better than pure guesswork, for it tells the health officer what needs to be done, and he can see for himself as well as show others.

Prior to the appearance of the appraisal form, many of us sat in our chairs and favored this or that line of activity, according to the pressure being brought upon us at the moment, or because of an address or article we had recently read, or as the particular fashion of the hour dictated.

When an appraisal takes place in his county, the health officer has an immediate appreciation of the value of records, discovers the lack of balance in his program due no doubt to a particular personal interest which he has developed for some functional activity, for example, child hygiene or venereal disease, and finds that the more he uses the appraisal the more he can define with some significance the worth while procedures undertaken. The appraisal when properly used becomes in fact an objective tool for intelligent supervision.

FIELD TECHNICAL SERVICE

To assure supervision which would result in such well-balanced programs in each area and a reasonably uniform program throughout the state, Tennessee in 1930 under Dr. Bishop's direction, and Mississippi in 1931 under Dr. Underwood's guidance, have set up a field unit or field technical service which operates out of the central office. This unit acts in an advisory capacity in technical public health procedures and assists the local department, but has no administrative authority delegated to it except in unusual circumstances. In other words, the effectiveness of the

unit depends on the ability of its staff to demonstrate the advantages of approved technical procedures which are recommended.

Its personnel consists of a medical health officer, with actual field experience as a local health officer plus at least a year's training in a school of public health. In addition, this individual has tact and diplomacy, and the ability to get things done.

The second member of the staff is a nurse who has had supervisory or assistant supervisory experience in a local health department and who appreciates to the fullest extent the qualitative characteristics of nursing visits, their content, as well as the quantitative measure of a nursing job.

The third member of the staff is a sanitation officer, preferably with the training of a sanitary engineer, although this training is not a *sine qua non* provided the individual is familiar with the problems of sanitation in the area and has demonstrated in a local jurisdiction ability to get results in this field.

The fourth member of the staff is the field clerk, whose job it is to advise and assist the local clerical staff in the proper handling and filing of records.

In addition to the annual appraisal of the local department, the director of the field unit goes over with the health officer the local services, aids the health officer in determining the most important problems in the area under consideration, discusses present and future plans, and suggests methods of accomplishment. He calls the local health officer's attention, for example, to the number of defects found in the examination of school children and makes the important point that in spite of the time and money spent on discovering these defects a very small percentage of them has been corrected. He relates these facts to the number of nursing visits to school children. He or his nursing assistant discusses the number of visits made by the nurse or nurses and sets up a quota in the several functional fields to be followed, depending of course on the problems to be met.

Records are studied with regard to their proper interpretation; budgets are considered with relation to the job in hand, and are planned with thought as to the amount of money available and the work to be accomplished.

Technical demonstrations are put on by the director of the field unit with the aid of the field unit nurse, covering such things as the proper plan and procedure to be followed in infant and preschool conferences, prenatal conferences, and immunization clinics. Efforts are made to interest the health officer and his nursing staff in the investigation of the source and mode of infection in acute communicable disease.

The field unit nurse, after studying the quantity and quality of service rendered by each local nurse, makes home visits with her to observe the effectiveness of nursing teaching and to demonstrate methods. She also visits clinics with the local nurse and in every manner possible raises the level of the quality and quantity of nursing performance.

Similar efforts are made by the sanitation officer, first in determining the local problems and then in planning the job with the local sanitation officer, in order that a sound program may be pushed forward from month to month and year to year with the proper recording of facts and accomplishments. The actual presence of a representative of the state health department in a local jurisdiction often lends sufficient prestige to the local sanitation officer to bring about immediate compliance with a rule or regulation. For example, an incorrigible milk dealer who has been found by the local sanitation officer exceedingly difficult to handle has been brought into line by the mere presence of a state official in the area.

The field clerk sees that each local department follows the procedures laid down by the record manual, and stimulates the local clerical staff to wring from each set of records the important factual information.

Visits to the local area by members of the field unit staff are scheduled in advance through the director of county health work and are usually on an individual basis. But each member of the field unit at the end of each visit in the area of from several days to a week discusses with the local health officer his or her recommendations and in addition makes a formal memorandum of the visit with detailed observations to the director of county health work through the field unit director. A copy of the memorandum is left with the local health officer in the area.

Once a month, as a rule, the field unit staff as a group confers with the director of county health work with regard to the local health departments visited.

After study of the field unit reports the director of county health work, with the approval of the state health officer, sets in motion the machinery which will furnish the local health officer with any help needed. This aid is furnished by any one of the several bureaus or divisions in the state health department, such as vital statistics, engineering, child hygiene, or communicable disease. If aid is needed from sources outside the state health department, such as the state or federal department of agriculture, for example, the director of county health work in his position as deputy commissioner of health makes the necessary contact.

Field unit reports of visits to local health departments are filed and made available to all bureau and division directors. Copies of all pertinent reports with regard to local health service are carried by the field unit staff when revisits are made to a particular area. This enables the staff to check on progress made and prevents unnecessary duplication of effort as well as ensuring continued service with a definite purpose in mind. In other words, it reduces to a minimum the number of casual and unproductive visits by members of the state health department staff.

The whole spirit of the field unit is one of efficiency, of authoritative knowledge, of skill and thought in the several functional

fields, which brings to each health officer not only a high-grade advisory service but a very personal and sympathetic contact at regular intervals between the state department and the local health officer and his staff. Such a field unit not only brings the policies of the central office to the attention of the local health officer, but gathers from the several local health departments ideas with regard to variety and methods of procedure in the several fields, the best of which the field unit in turn transmits, as it goes about, to other local departments to their advantage.

Various specialized technical services have been and are being offered in several fields by state health departments; one of the most notable perhaps is that of a field diagnostic tuberculosis service which, with the aid of portable X-ray equipment, a technician, and a well-qualified diagnostician, brings to the rural area and to the practising physician high-grade service which makes possible the early and expert diagnosis of cases and examination of contacts.

THE EPIDEMIOLOGICAL UNIT

In order to give impetus to and create greater interest in epidemiology on the part of the local health officer and his staff, a specialized service in this field is being carried on in Mississippi.

The personnel of this service is made up of a medical director, a nurse, and a bacteriologist. The first two of these individuals, in addition to their basic experience in public health, have had special training in the investigation of and the institution of control measures for acute communicable diseases. These two individuals visit a county together for a period of from two to four months, during which time they work with the local health department staff. They devote their efforts to teaching the local health workers the principles of field epidemiology, placing particular emphasis on the investigation of sources and modes of infection, and the importance of accurate and complete records, the effective follow-up of cases and contacts, and the several pos-

sible channels of spread. Practising physicians are contacted. They are told of the importance of early diagnosis and consultation in any case of suspected communicable disease. They are informed of the services which the local and state health departments provide for their use in the way of diagnostic service, of vaccines and sera, and in laboratory services.

The bacteriologist with the unit is located in the central laboratory where she examines specimens sent in from the counties in which the epidemiological unit is working. In addition she is concerned with improving the various procedures having to do with a particular type of specimen from the time it is secured in the field, through its transmission to the laboratory, the technical examinations therein, to the final report of findings.

In short, the epidemiological unit makes a particular effort to coordinate, insofar as it is possible, all the factors, both of personnel and of services, which play a part in making effective the prevention and control of communicable disease. This type of service to a local health unit is analogous to that offered by the field unit mentioned above and after it has accomplished its purpose, namely to raise the level of epidemiological interest and activity to a point justified by its importance, it should logically become the continuing responsibility of the field unit or field technical service.

In addition to aids already mentioned, specialized services have been offered by state health departments in the setting up of venereal disease clinics and in diagnostic services primarily in connection with widespread or severe outbreaks of some particular type of communicable disease such as acute anterior poliomyelitis, meningococci meningitis, pneumonia, et cetera, although these are ordinarily of a temporary nature. Various other specialized services, usually not available locally, have been set up from time to time in other fields, such as diagnostic orthopaedic service for crippled children, dental, and other services which will occur to

you, including diagnostic clinical service for chronic diseases, especially cancer.

In conclusion, several administrative aids have been discussed as tools for the improvement of local health service. Among those which have been emphasized as especially useful in states with local, county, or district health units are (1) the appraisal form for rural health work, (2) the field unit or field technical service, and (3) the epidemiological unit.

MEASURING HEALTH NEEDS IN AN URBAN DISTRICT[1]

by DOROTHY G. WIEHL

INTRODUCTION

AN evaluation of the public health services in a community may be approached in at least three different ways. First, there is the most common method of measurement which is based on quantitative indices of the volume of service and a comparison of these with certain yardsticks or standards of service believed to be reasonably adequate for the average community when the population, death rates, and reported incidence of communicable diseases are taken into account. This is termed the appraisal of health activities according to the standard set forth in the "appraisal form." A second quantitative approach to the adequacy of the various types of health activities in a specific community may be based on the determination of the extent of health needs of individuals and families and the extent to which these needs have been met. A third method of evaluation is to study the quality of the particular services rendered. The last involves more a critical appraisal of the techniques and practices used in carrying on specific activities and of the results or effectiveness of the services rendered. For a complete evaluation of the health services in a community, obviously they should be studied from both the quantitative and qualitative point of view.

The present paper reports on an experiment in applying the second method of evaluating quantitatively the adequacy of health activities. An attempt has been made to assemble data on the extent of certain health problems for a sample population in a single health district in New York City and to study the nature

[1] From the Milbank Memorial Fund. This is the first in a series of articles reporting on a survey in the Mott Haven Health District. The adequacy of services in relation to specific problems will be considered in the next paper which will be published in the April *Quarterly*.

and amount of service provided for them. Only the activities of the Health Department of the direct, personal type for the prevention of disease and promotion of health are considered. Such activities are a major function of the modern health department and many public health nurses and physicians provide educational, preventive, diagnostic, and corrective services for the promotion of maternal, infant, and child health and the control of tuberculosis and other communicable diseases. An evaluation of the extent to which this part of the health program is adequate should consider all evidence on the prevalence of health problems in a specific community and the record of services provided by the Health Department or others to meet these health needs. Some measure of the relation of the services rendered to the actual need is of especial value when the community under consideration is a poor district in a metropolitan area for which such indices as infant and tuberculosis mortality show the need of preventive health service to be relatively great.

This problem of determining the extent of unmet needs for health services was made the subject of a special investigation in the Mott Haven Health District of New York City in 1932.[2] This district was not at that time organized for district administration of health services and was typical probably of most districts in New York City in which no intensive program was being carried on with the aid of non-official agencies. A survey was made of about one thousand families during the latter half of 1932 to collect data which would reveal the extent of preventive and educational health services among them, the extent of neglected health problems, the amount of ill health and medical care received, and other relevant facts concerning the economic and environmental conditions of the families. The study was undertaken as an experi-

[2] This investigation supplemented other studies conducted by the Committee on Neighborhood Health Development, members of the research staff of the Milbank Fund and several specialists who collaborated on special phases of the studies in connection with the preparation of a program for organizing the health activities on a district basis to bring the services closer to the needs of specific neighborhoods.

ment in measuring the adequacy of the public health activities; to provide data which could be used in guiding the development of a more adequate program; and also to afford a base line against which improvements in the service under the recently inaugurated District Health Administration in Mott Haven could be measured at a later date.

DATA COLLECTED

A home visit to each family in this study was made by an investigator who obtained a complete roster of the family with age of each member and the place of birth, education, and religion of the husband and wife in the family. The approximate earnings and type of work of each employed person during the twelve months preceding the investigator's visit were recorded and also recent changes in employment or rate of pay. The housing data obtained included the monthly rental, number of rooms, kind of heat, toilet and bath facilities, and length of residence at present address.

The informant was asked specifically if any public health nurse had called and, if so, for what purpose; if any member of the family had attended a health department clinic; and if the family had been notified of any health condition in a child of school age which should receive attention and, if so, what had been done about it. For every child, the investigator inquired as to whether it had been vaccinated against smallpox and immunized against diphtheria and by whom. Illnesses during the previous twelve months and any medical or nursing care received were asked for and a record taken of the source of such care, whether from a private physician, a hospital clinic, the health department, or other agency.[8]

The names of all families in the survey, not just those who had

[8] It was not expected that a complete record of illness and medical care could be obtained for as long a period as a year. Most of the prolonged or serious illnesses would be remembered and it is believed that the record of children's communicable diseases is fairly complete.

reported some health service, were checked against the records of service on file at the Health Department clinics, at the schools on the medical examination cards or on the nurses' records, and in the office of the Henry Street Visiting Nurse Service. Records at the hospital clinics and the dental and eye treatment clinics in the public schools were not checked, the family statement being accepted for the medical care received.

REPRESENTATIVENESS OF THE FAMILIES STUDIED

An effort was made to visit an unselected sample of families which would be well scattered over the entire Mott Haven district. Since the district contained 56,913 families according to the 1930 Census, the 1,049 families visited were slightly less than two per cent of the total. The general plan followed was to canvass about two per cent of the families in each of the 39 Census tracts which had from 50 to 3,665 families. Obviously not all blocks or even neighborhoods could be sampled, but in tracts with a large number of families those visited were scattered in different blocks and districts within the tract to provide a few families from the various types of homes. The final count of completed schedules grouped according to health areas, a combination of Census tracts with approximately 25,000 population, showed that the per cent of families visited in some areas varied considerably from the two per cent average, as may be seen in Table 1. Nevertheless, the families in the study are reasonably well distributed and all types of neighborhoods are represented.

Some evidence of the extent to which the sample may be con-

Table 1. Percentage of families in each health area of the Mott Haven district which is included in the surveyed sample.

	Total Mott Haven	Health Area										
		37	38	39	40	41	42	43	44	45	46	47
Number	1049	101	84	93	174	72	120	43	94	83	105	80
Per Cent	1.8	1.9	2.1	1.8	3.0	1.3	2.1	1.1	1.6	1.9	2.4	1.3

sidered representative of the district as a whole is afforded by the distribution of the families according to monthly rental and nativity. Since health services for one year were to be considered, it has seemed best to base this study on the families which resided within the Mott Haven district throughout the period. There were 801 such families. Comparison of these families with data from the United States Census for the entire Mott Haven district indicates that the proportion of families in the rental class of $50 or more per month and the proportion of Russian and Polish families, most of whom are Jewish, are both smaller than in the district as a whole.[4] In other words, our sample contains less than a representative proportion of the higher economic group of Russian

[4] Monthly rentals and ownership of homes are the only data indicative of the economic status of families available for both the survey sample and the entire district. From the United States Census, rental data for the district as of 1930 are available while rentals for the survey sample are for 1932, but rents had declined during these two years. From the Real Property Inventory, a distribution of rents for the district is available for 1934, but a further general decline had taken place by this date. Therefore, the rentals at the time of the survey would fall in between those for which district data are available. The distributions of rentals from these several sources are shown below, and it is apparent that the sample has a smaller proportion of families paying $50 or more per month than would be typical for the health district.

Distribution according to tenure and monthly rental of families in the survey and of all families in the Mott Haven Health District.

Tenure and Monthly Rental	Survey Sample		Mott Haven Health District	
	Number	Per Cent	United States Census, 1930 Per Cent	Real Property Inventory, 1934 Per Cent
TOTAL	801	100.0	100.0	100.0
Owned homes	14	1.7	5.6	5.1
Rented homes	787	98.3	94.4	94.9
By Rental for Rented Homes[1]				
TOTAL	725	100.0	100.0	100.0
Less than $10	0	0.0	.1	.8
$10—$19.99	17	2.3	2.3	8.2
$20—$29.99	228	31.4	12.3	31.6
$30—$49.99	458	63.2	57.5	51.7
$50—$74.99	22	3.0	23.5	6.5
$75 or more	0	0.0	4.2	1.2

[1] Excludes 15 families in the survey sample with unknown rental and 47 families who gave janitor service for rental.

(Continued on page 28)

and Polish families. The Italian families, on the other hand, make up a slightly larger portion of the sample than is typical of the district. Our sample, however, seems reasonably typical of the 75 to 85 per cent of families in the Mott Haven district which in 1932 were paying less than $50 per month.

The age distribution, as shown in Table 2, was somewhat younger for the surveyed population than that of the entire district. The relatively high proportion of school children and younger children would tend to increase the chances of a family having some public health service. For this reason, and because of the small number of high-income families in the sample, the amount of health care reported for these families is no doubt a maximum and probably somewhat higher than an average for all types of families in the district.

The percentage distribution for the sample according to color and place of birth of the family heads is compared with that given by the Census for the entire district in the following table. A marked similarity will be noted but some differences appear too. The principal significant difference is that, in the survey sample, a smaller proportion of the heads of households were born in Russia or Poland and a larger proportion in Italy. Examination of data on nativity for specific health areas reveals that in Health Area 43, Russian and Polish family heads formed 42.6 per cent of the total or nearly twice the average percentage for the district and this area (Table 1) contributed relatively few families to the sample. It is also an area with a relatively large percentage of families paying high rents. On the other hand, Health Areas 38 and 39, where a normal proportion of the families were visited, contain the principal Italian districts and in Area 38 a disproportionately large number of Italian families were canvassed.

Percentage distribution according to color and nativity of heads of families in the survey and of all families in the Mott Haven Health District.

Color and Nativity of Head of Family	Survey Sample		Mott Haven. U. S. Census 1930
	Number	Per Cent	Per Cent
TOTAL FAMILIES	801	100.0	100.0
White (Total)[1]	781	97.5	98.6
Native-born	253	31.6	29.8
Foreign-born	524	65.4	68.8
Russia-Poland	123	15.4	23.5
Italy	127	15.9	9.6
Ireland	77	9.6	8.0
Germany	64	8.0	7.8
All other	133	16.6	19.9
Negro and other colored	20	2.5	1.4

[1] Includes four families with place of birth unknown for head of family.

Age Group	Survey Sample		U. S. Census 1930
	Number	Per Cent	Per Cent
ALL AGES	3,587	100.0	100.0
Under 5 years	372	10.5	8.2
5–14	859	24.1	17.8
15–24	650	18.3	20.1
25–44	1,100	30.9	34.4
45–64	500	14.1	16.3
65 and over	76	2.1	3.2
Unknown	30	....	....

Table 2. Age distribution of population surveyed compared with that of the Mott Haven Health District according to the 1930 Census.

HEALTH FACILITIES

The Health Department maintained two Baby Health Stations in the Mott Haven district in 1931 and 1932, one prenatal clinic and a tuberculosis clinic. The public health nursing service was specialized, that is, different nurses were responsible for the infant supervision, tuberculosis care, communicable disease follow-up, and school child service. When one of these nurses went into a home, she limited her attention to the health problem which had been the cause for making a home contact. In addition to these health education and supervisory services, the Health Department operated dental clinics for school children in six schools and an eye clinic in one school. There was also a special clinic for the examination of food handlers.

The principal preventive health services offered by private agencies in the district were those given by the Henry Street Nursing Service which had a district office in Mott Haven and operated a Baby Health Station. The Henry Street nurses gave general health instruction in the homes in addition to giving home nursing care for morbidity.

One City hospital and one private hospital in the district provided clinics for prenatal and postpartum care and infant clinics for mothers delivered in the hospital. Both also had out-patient clinics for most types of medical care.

I. EXTENT OF SERVICE TO FAMILIES

There were 77 families, or 9.6 per cent of the 801 families, which had received some direct service from the Health Depart-

ment, either from a public health nurse in the home or from a physician or nurse in a clinic, during the twelve-month period prior to the investigator's visit.[5] This does not include the health examination of school children[6] nor the immunization of children against smallpox and diphtheria.

The specific health problems which received attention during the year are shown in Table 3. Physical defects of school children were the most frequent problem and 5.0 per cent of all families in the study, or more than one-half of those receiving any service, had supervision from the Health Department because of some defect which needed correction. The second largest group of families with service was comprised of those with an infant for which instruction was given on feeding and other hygiene matters; 2.6 per cent of all families received this service. There were nine families, or 1.1 per cent, which came to the attention of the Health Department because of tuberculosis. Other health problems, including communicable diseases, health examinations, and anti-rabies treatment, were the cause of service to one per cent of the families in the survey. No family reported any attendance at the Health Department prenatal clinic.

The general nature of the service, whether a home visit by the public health nurse or attendance at one of the clinics, is indicated in Table 3 for each type of health problem. When infant hygiene

[5] In general, the informant's statement of service was accepted, even if the record of service was not located, when the information was sufficiently specific to give reasonable evidence that the service was received within the period under consideration. A very few reported services were discarded, particularly those of nurses' home visits to school children when the record on file showed no visit for this period. At most, the reported services not counted would add less than one per cent to the proportion of families receiving service.

[6] There were 112 families, or 14 per cent of the total, which had had one or more children examined by the school physician during the year; 78 of them had had no other service from the Health Department. Medical examinations of school children are now required by law and the routine followed in New York City is to examine those in certain grades each year. Since this service definitely is provided for all, there is no question of the extent to which the population is reached; the quality and effectiveness of the examination, and efficiency of administration are the points of interest for appraisal. However, these examinations reveal to the public health nurse many health problems among the school population and the services rendered in caring for these will be discussed.

Health Problem	Per Cent of Families in Survey	Number of Families	Families with Specified Type of Service		
			Home Visit by Nurse Only	Clinic Visit Only	Clinic and Home Visit
TOTAL FAMILIES WITH SERVICE	9.6	77[1]	41	19[1]	17
Defect of school child	5.0	40	35	4	1
Infant hygiene	2.6	21	0	9	12
Tuberculosis, definite or suspected	1.1	9	1	4	4
Communicable disease	.6	5	5	0	0
Health examination—adult	.2	2	0	2	0
Anti-rabies treatment	.1	1	0	1	0

[1] One family had supervision for both tuberculosis and infant hygiene and is counted only once in the total; it had clinic service only for tuberculosis but the infant had both home nursing visits and clinic visits.

Table 3. Number and per cent of the 801 families in the survey which had service for various health problems and number with clinic and nursing service in a twelve-month period in the Mott Haven District, 1931-1932.

or tuberculosis is the problem, both clinic and nursing service usually are given, and the major part of both the educational and supervisory service is provided at the clinic. Both types of service were rendered to no other families in this series with the single exception of one which was visited by a school nurse for the correction of a defect of vision in a school child who was later cared for at the school clinic.

Only one family had had any supervision for more than one health problem. The infrequent occurrence of service for more than one problem in the same family suggests that the nurses in the district, who are on a specialized service, failed to utilize a home visit for a specific problem as a case-finding opportunity and to refer other health problems in the family for attention.

Since most of the health services rendered related to child health, the age composition of the family influences the probability of its receiving some preventive service. There were 543

families with children under 15 years of age in this sample and 74 of the families with service were in this group. Thus, 13.6 per cent of the families with children had service from the Health Department in the twelve-month period.

Volume of Service. Health Department nurses made one hundred visits to the homes of the 54 families whose record of service could be located, or an average of 1.9 visits per family. Only ten of the 54 families were visited more than twice (Table 4).

Table 4. Number of times a public health nurse visited a family or some member of a family visited a clinic in a twelve-month period in Mott Haven district, 1931-1932.

Number of Visits	Home Visits by Nurse	Visits to Health Department Clinic
ANY NUMBER	54	20
1	26	2
2	18	2
3	6	3
4	2	1
5	1	0
6–10	1	6
11 or more	0	6

For the 20 families whose records of service at either an infant clinic or tuberculosis clinic were available, the total visits to clinic[7] were 162, as shown in Table 4. The clinic record could not be found for 7 of the 21 infants reported as having been registered at a Health Department clinic, and it is possible that these had made only one or two visits, and that, if these records could be included, they would reduce the average number of visits per family. However, it is apparent that repeated visits to the clinic were made by most of those who used this service, and 12 of the 20 families had had from 6 to 21 contacts with a nurse or physician at a Health Department clinic.

Service According to Economic Status. With less than 10 per cent of the families having either clinic service or home instruction by a public health nurse, it is interesting to see from what economic groups these families were drawn. In Table 5, the families have been grouped in three income classes as follows:

[7] Visits to clinic were counted on a family basis and are the number of different occasions on which one or more members of the family attended the clinic.

Economic Status	Total Families Surveyed	All Health Problems	Defect of School Child	Infant Hygiene	Tuberculosis	Communicable Disease	Other
			NUMBER OF FAMILIES				
Relief	123	20	10	6	3	1	0
Poor	323	35	15	11	5	3	1
Moderate	224	15	10	4	1[1]	0	1
Unknown	131	7	5	0	0	1	1
			PER CENT OF FAMILIES				
Relief		16.3	8.1	4.9	2.4	.8	0
Poor		10.5	4.7	3.4	1.5	.9	0
Moderate		6.7	4.5	1.8	.4	0	.4
Unknown		5.3	3.8	0	0	.8	.8

[1] This family is included also in the infant hygiene group.

Table 5. Per cent of families in specific income groups which had service from the Health Department in Mott Haven Health District during a twelve-month period, 1931-1932.

"relief families" including all those receiving welfare aid for any part of the twelve-month period; "poor" including families with up to $1,400 income; and "moderate" including all with a reported income of $1,400 or more.[8] Among families which had had welfare assistance, the per cent receiving some health service was 16.3 compared with 10.5 per cent for the "poor" families and 6.7 per cent for the higher income families.

The need of relief families and those with marginal incomes for instruction and assistance in providing adequate health supervision for their children is too well known to require objective evidence. The proportion of families with children which received any health supervision is shown in Table 6. Even among the most underprivileged group, more than four-fifths of the families with children had no service from the Health Department.

Services from Private Agencies. The instructive health supervision given by the Henry Street Nursing Service in this district

[8] The income data was by no means exact and for 268 families no approximate annual income was computed, but the record of unemployment, type of work, et cetera, permitted us to classify 157 of them in either the poor or moderate group. It is believed that, of the remaining 131 families, nearly all belong in the moderate group as the distribution of the rentals for these families corresponds closely to that of the moderate group.

Economic Status	Families with Children under 15 Years of Age		
	Total Families	Received Clinic or Nursing Health Supervision	
		Number of Families	Per Cent of Total
Relief families	100	19	19.0
Poor	194	33	17.0
Moderate	159	15	9.4
Unknown	90	7	7.8

Table 6. Per cent of families in which there was one or more children who had Health Department service in a twelve-month period according to economic status of families, Mott Haven district, 1931-1932.

related almost entirely to the supervision of maternity patients and a complete program of prenatal, postpartum, and new-born infant care was provided. There were 26 families in our survey which reported either maternity or infant care or both from a Henry Street nurse in the twelve-month period, and only three which reported supervision for other health problems,[9] making a total of 29, or 3.6 per cent, of the 801 families in the study.

Since 7 of the 29 families under Henry Street supervision also had had some Health Department service, there were 22 families with health supervision in addition to the 77 reached by some Health Department activity. Therefore the total number of families with some instructive or corrective health care was 99, or 12.4 per cent of all families in the survey.

Prenatal clinics conducted by the two hospitals in the district and by several hospitals outside the district gave medical care to 20 mothers who bore a child during the twelve-month period included in this study. Although this care is a preventive service, it does not make the supplementary instructive and home service of the official or voluntary agencies unnecessary.

COMPARISON WITH OTHER AREAS

Data are available from a similar study of a small sample of families living in the low-rental sections of the Bellevue-Yorkville

[9] Bedside care for morbidity has not been included when that was the only service; 16 families reported this type of care.

Health District of New York City where a health demonstration under the auspices of the City Department of Health and with the cooperation of a number of private agencies had been in progress for several years. Families were visited in 1932 wholly at random and exactly the same information was obtained as in the Mott Haven district. Of the 156 families for which preliminary tabulations have been made, only 4 paid more than $40 a month rent and the sample seems roughly comparable, therefore, with the "relief" and "poor" groups in the Mott Haven study.

In Bellevue-Yorkville, the per cent of families reporting health service from a Health Department clinic or nurse was 39.1 as against 9.6 in Mott Haven for all families, and 12.3 for the two low-income groups.[10] When the comparison is made on the basis of families with one or more children, we find that 55.5 per cent of such families had had service as against 17.7 in Mott Haven. In other words, more than three times as many families in every one hundred low-income families had health supervision in Bellevue-Yorkville as in Mott Haven.

A further comparison may be made with Syracuse, New York, for which a study of the extent of service to families according to income has been published.[11] Here it was found that 49.1 per cent of families classed by the investigator as "poor" or "very poor" and with one or more children had had clinic or home supervision by the public health nurse. This figure includes some maternity service but the number of families out of a random sample with this type of service in one year is very small.

It seems evident from these general data that the amount of service provided in the Mott Haven district was insufficient to supply more than a very small part of the population with any

[10] The services included for the two areas are comparable but some types of service included for Bellevue-Yorkville were not in the Mott Haven program, as, for example, preschool clinics. Prenatal and maternity services in both areas were furnished by private agencies, and more well-baby clinics and nursing supervision were available in addition to the Health Department's services in Bellevue-Yorkville than in Mott Haven.

[11] Randall, Marian G.: Health Department Nursing Service for Urban Families. Milbank Memorial Fund *Quarterly*, January, 1934, xii, No. 1, p. 75.

kind of health service. So large a proportion of the families in the district are either very poor or on very marginal incomes that a large volume of service would be required to enable the Health Department to extend its activities for the prevention of disease and the promotion of personal health into the homes of any considerable part of the district's low-income population. However, health facilities were provided on a much larger scale in Bellevue-Yorkville and the needs in Mott Haven would seem equally great.

(*To be continued*)

THE FERTILITY OF POPULATIONS SUPPORTED BY PUBLIC RELIEF

by FRANK W. NOTESTEIN[1]

IN 1934 there was a sudden outburst of news items, special articles, and editorials concerning the fertility of the population supported by public relief. Many of these accounts were accurately reported summaries of scientific studies. Others, and certainly the most alarmist among them, ran under such captions as "Birth Rate of Families on Dole Up 35 Per Cent," and virtually left the reader the impression that procreation becomes the first concern of families when they are accepted for public support. One widely-read magazine drew the inference from its report of a special study that "a family's expectation of having children increases 35 per cent when it goes on the dole," and indicated that the result of the dole would be 108,000 more babies "than would otherwise be expected." Opinion to this effect is so widely held that it is important to examine its accuracy with some care. Just what do we know about the fertility of populations on relief, and how can we proceed to fill the important gaps in our present knowledge?

The source of this opinion lies in the fact that two different types of problems are confused. Both are important, but the solution of one does not yield that to the other. One is concerned with the level or status of fertility in relief families; the other with changes in fertility associated with the fact of dependency. Most of the research has been directed to the former problem, but conclusions soundly drawn and precisely stated to the effect that relief populations are relatively fertile have been interpreted to mean that they became so after their dependency—which is an entirely different matter.

Of the three original studies which have received the most atten-

[1] From the Milbank Memorial Fund.

tion, that by Popenoe and Williams,[2] has the least bearing on the matter in hand. Their principal conclusion that, "The longer a family is in receipt of charity, the more children it produces," is self-evident. A second conclusion is that, in the group studied, fertility "is at least not diminished by the fact of becoming a recipient of public charity." This is based on the fact that women who bore an average of 2.72 children before first dependency, bore 1.58 children after their first dependency when their natural reproductive capacity was becoming lower because of advancing age. Such uncontrolled evidence is scarcely convincing.

A study by Sydenstricker and Perrott[3] based on data for samples of families drawn from the poor sections of eight cities has been widely misinterpreted as indicating that the receipt of relief increased the fertility of dependent families. Actually, the study yielded no information bearing on this point for two reasons: (1) The birth rates presented were exclusively average annual rates for the entire period from 1929 through 1932 and do not permit the analysis of the fertility trends of any group; and (2) these rates were largely dominated by conceptions which occurred before the relief families of 1932 became dependent.

The actual findings, however, are highly interesting and significant. They show among other things that "the average annual birth rate in families on relief [in 1932] was 53 per cent higher [for the period 1929-1932] than in those not on relief, even in this low-income class [*i.e.*, under $1,200]. Doubtless families with more children, especially infants, were singled out by welfare agencies for greater attention than smaller families, or families without infants, but the fact remains that the higher birth rate in these poor families is directly related to the necessity for public and private charity."

[2] Popenoe, Paul and Williams, Ellen Morton: Fecundity of Families Dependent on Public Charity. *The American Journal of Sociology*, September, 1934, xl, No. 2, pp. 214-220.

[3] Sydenstricker, Edgar and Perrott, G. St. J.: Sickness, Unemployment, and Differential Fertility. Milbank Memorial Fund *Quarterly*, April, 1934, xii, No. 2, pp. 126-133.

This study, therefore, indicates a higher level of fertility during the period 1929-1932 for families dependent on relief in 1932, but it does not indicate, nor does it pretend to indicate, that the fertility of the group increased. Data which have become available since the publication of the original article, show that the average birth rate of those on relief in 1932 was the same for the two-year period 1931-1932 as for 1929-1930, while that for the non-relief group with incomes below $1,200 dropped about 12 per cent.[4] Both the decline in the rates of the low-income non-relief group, and its absence in the dependent group may well have been due to the greater willingness on the part of the authorities to accept families with young babies. This is a potential selective factor which must not be overlooked in any study of the fertility of the dependent.

The study which Stouffer conducted in Milwaukee on the "Fertility of Families on Relief,"[5] can be more plausibly interpreted as indicating that fertility rises during dependency; it at least deals with the period of dependency. However, it presents no direct evidence of such an increase, and the author warns his readers that, "A danger lies in the temptation to read too much into such data."

The study is actually one of differences between the confinement rates of persons on relief and of those not on relief but in the same broad occupational and religious groups. It relates to the period between October 1, 1930, and December 31, 1933. The influence of pregnancies which might have contributed to the eligibility of families for relief was eliminated by including only those confinements which took place at least nine months after the family went on relief, or within a comparable period for con-

[4] Data from correspondence with Perrott yield the following rates:
Average annual birth rates (adjusted for age) per 1,000 married women 15-44 years of age.

1932 Incomes Under $1,200	1929–1930	1931–1932
Relief	191	191
Non-relief	129	113

[5] Stouffer, Samuel A.: Fertility of Families on Relief. *Journal of the American Statistical Association*, September, 1934, xxix, No. 187, pp. 295-300.

trol families. The study, therefore, affords an excellent comparison of the fertility of relief families during dependency with that of non-relief families in roughly comparable groups. The records indicate that the relief groups of each class were the more fertile. For the entire sample, the confinement rate for families on public relief exceeded that for the control group by 43 per cent.

Such rates for the relief groups would have occurred if fertility increased after dependency, but they also might have occurred if fertility had simply remained high during dependency. The study yields no evidence as to what actually happened. Other considerations, however, strongly favor the suggestion that the fertility of relief families was greater than that of the control families before as well as during dependency. As has already appeared, Sydenstricker and Perrott's data indicate that the 1929-1930 birth rates were substantially higher for the 1932 relief population than for the non-relief population with incomes under $1,200. Any selection of large families with small children for relief would tend in that direction. Even apart from such a selection, the difference found is in the direction to be expected. Numerous studies have shown that in this country low economic status is associated with high fertility, and by definition relief families constitute the low-income groups of each class.

No study of changes in fertility associated with dependency can be based on a comparison of the fertility levels of relief and non-relief families. However carefully a control is chosen, the groups will differ by the selective factor of dependency, and the differences observed will be subject to the interpretation that they represent differences in levels rather than a change in fertility following dependency. The only direct approach to the problem of change in fertility associated with dependency lies in a comparison of the experience of relief families during dependency with their experience when self-supporting.

Measurement of the changes in fertility brought about by de-

pendency is not a simple matter, even when it is based on trends observed in relief families. The presence of new-born babies or the wife's pregnancy may be factors in determining the time at which relief is first obtained. The former would tend to place the beginning of relief after a period of high fertility, and the latter to place it before such a period. Neither factor has any bearing on the effect of dependency on fertility. In order to avoid a possible bias from either of these sources, it would be wise to omit the experience for twelve months immediately before and nine months immediately following the time at which relief is first given.

Other serious biases will be encountered in any study of changes in the fertility of relief families accompanying dependency. Virtually all of the material available relates to cases in which dependency follows self-support. This means that for any given family, dependency occurs later in the marriage when fertility tends to be lower. This sequence is the more serious as the selective process of being accepted for relief makes it wise to omit the experience for nearly two years centering around the date of first dependency, thereby separating the two parts of each family's exposure still further. It is essential, therefore, that comparisons be limited to the experience during similar periods of married life. In view of the fact that we have a declining birth rate, it is further necessary to limit the comparison to experience which occurred at about the same time. This would result in comparing birth rates for pre-dependency and dependency exposures during those parts of the first five years of married life which occurred, for example, in the years 1925 to 1929, or 1930 to 1934. It would be highly desirable in such a study to secure data from families which had become self-supporting after a period of dependency, thereby reversing the inherent biases. Further confidence would be placed in the results if data for a control group of non-dependent families could be analyzed in precisely the same manner. The method is expensive but it, or another which accomplishes the same thing, is necessary if changes

in fertility accompanying dependency are to be determined by studying the experience of relief families. So far as the writer knows, no such study has been published.[6]

An indirect approach to the problem may be made by examining the official vital statistics for the period. If we had any certain knowledge of the population of minor statistical units, and if relief data were classified according to these units, the problem would be quite simple. As it is, however, all birth rates of small units for the last three years must be considered provisional, and the approach to the problem must be indirect.

Last June, the editors of the *Statistical Bulletin* of the Metropolitan Life Insurance Company called attention to the fact that the birth rate rose in 1934 for the first time in ten years.[7] They pointed out that this rise followed an increase during 1933 of the marriage rate which had also been falling for some time, and suggested that both of these reversals were the direct result of an upward turn in the economic tide. In the August issue, they presented "an alternative point of view."[8] According to this, "The increase in the birth rate that was recorded in 1934 . . . may not be related at all to any increase in income of the self-supporting portion of the people, but rather, on the contrary, may be attrib-

[6] Part of this suggested procedure has been used by Arthur J. Audy in "A Comparative Analysis of the Birth Rate of 965 Families Before and After Dependency," a thesis submitted in partial fulfilment of the requirements for the degree of Master of Arts, Loyola University, 1935 (unpublished). The writer wishes to express his appreciation of Mr. Audy's generosity in lending his manuscript and permitting the use of material from it.

Audy's study undertakes a comparison of the fertility of relief families before and after first dependency. The most interesting part of the data relate to 662 families which were receiving relief in December, 1934, from the main office of the Cook County, Illinois, Bureau of Public Welfare. Limiting the comparison to similar periods of married life, Audy finds that in most of the groups fertility was greater before than during dependency. In their present form the data are not wholly convincing. Most of the dependency experience is quite recent while much of the pre-dependency period occurred a good while ago, some even before 1910. When the comparison is limited to the most recent experience, the rates are higher during dependency than before for every marriage period but one. It is possible that the results might have been different if the experience immediately preceding and immediately following first dependency had been discarded.

[7] Better Times and the Birth Rate. *Statistical Bulletin* of the Metropolitan Life Insurance Company, June, 1935, 16, No. 6, pp. 1-2.

[8] Families on Relief and the Birth Rate. *Statistical Bulletin* of the Metropolitan Life Insurance Company, August, 1935, 16, No. 8, pp. 1-3.

utable to increased dependency on relief." Sydenstricker and Perrott's and Stouffer's papers are summarized and they comment: "If the situation thus observed in small groups is paralleled in the population at large, we should find our greatest increase in birth rates to have occurred in States with the highest proportion of families on relief." This follows only on the assumption that these special studies showed that relief families increased their fertility on becoming dependent, and this assumption, as we have seen, is not valid.

The article goes on to point out that of the thirty states which paid less to the federal government than they received, twenty-eight showed an increase in the birth rate. The eighteen states which paid more than they received included four of the six states in which the birth rate declined, and ten of the thirteen states in which the birth rate increased less than three per cent. The editors indicate that they consider the evidence suggestive rather than conclusive and await further indications of the true cause of the birth rate's reversal.

Miss Ross has pointed out in a recent article[9] that the exceptions are important. Of the six states which showed a decline in the birth rate, two, New Mexico and Arkansas, were among the states with the largest percentage of the population on public relief at the close of 1934. These two States tied with New Jersey for the largest decline in the birth rate. The remaining states in which the birth rate declined, or remained stationary, are clustered along the eastern seaboard and are, for the most part, highly industrialized areas with large foreign-born populations. States are very heterogeneous units, and so many different factors may influence the course of their crude birth rates, that conclusions based upon their trends are likely to be misleading.

New York State, exclusive of New York City, was not one of

[9] Ross, Mary: Other People's Babies. *Survey Graphic*, December, 1935, xxiv, No. 12, pp. 591-593, 632.

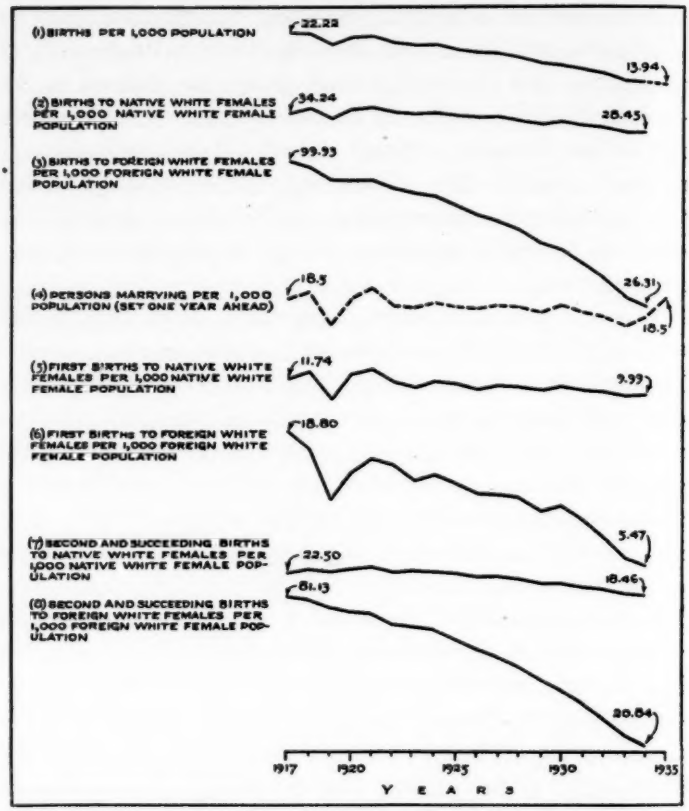


Fig. 1. The trends of birth and marriage rates in New York State exclusive of New York City. (Traced from semi-logarithmic charts without any relation to their absolute heights. The rates are presented in Table 1. Percentage changes in the rates for 1932 to 1933 and 1933 to 1934 are shown in Table 2.)

the regions in which the crude birth rate increased in 1934, but its experience lends support to the view that the general reversal which did occur is not to be attributed to relief families. In this region the increased marriage rate of 1933 seems to have been the important factor. This may be seen in Figure 1. The rates, which are shown in Table 1, have been traced from semi-logarith-

Year	Births Per 1,000 Population	Births to Native White Females Per 1,000 Native White Female Population			Births to Foreign White Females Per 1,000 Foreign White Female Population			Persons Marrying Per 1,000 Population
		Total Births	First Births	Second and Succeeding Births	Total Births	First Births	Second and Succeeding Births	
1916								18.5
1917	22.22	34.24	11.74	22.50	99.93	18.80	81.13	19.4
1918	22.09	35.13	12.17	22.96	93.97	15.75	78.22	14.6
1919	20.16	32.47	9.73	22.74	83.87	9.94	73.93	18.3
1920	21.32	35.27	12.13	23.13	83.08	12.81	70.27	20.1
1921	21.59	35.91	12.50	23.41	83.03	14.43	68.60	17.4
1922	20.31	34.08	11.22	22.87	77.08	13.70	63.38	17.1
1923	19.94	33.80	10.86	22.94	73.57	11.98	61.59	17.8
1924	19.89	34.00	11.28	22.72	71.49	12.41	59.08	17.1
1925	19.18	33.37	11.05	22.33	65.67	11.66	54.01	16.9
1926	18.30	32.29	10.50	21.79	60.09	10.61	49.48	17.3
1927	18.22	32.69	10.83	21.86	56.82	10.46	46.36	17.0
1928	17.51	31.79	10.67	21.12	52.36	10.25	42.11	16.4
1929	16.65	30.84	10.44	20.40	46.61	9.10	37.52	17.5
1930	16.51	31.08	10.79	20.29	43.49	9.41	34.08	16.4
1931	15.73	30.11	10.37	19.75	38.72	8.42	30.30	15.8
1932	15.11	29.54	10.14	19.40	33.94	7.17	26.76	14.5
1933	14.14	28.15	9.59	18.56	28.73	5.90	22.82	15.8
1934	14.06	28.45	9.99	18.46	26.31	5.47	20.84	18.5
1935	13.94							

[1] The population estimates on which the rates for the general population are based are those published by the State Department of Health. Estimates of the native- and foreign-born white females were obtained by applying the percentage of the population in those groups, estimated on the assumption of an arithmetic increase, to the total population estimated by the State Departmen. f Health.

Table 1. Birth and marriage rates for New York State exclusive of New York City.[1]

mic charts without any relation to their absolute heights, merely to bring out the differences in their trends. Equal changes on the chart represent equal percentage changes in the rates.[10] The percentage changes for the last two years are also given in Table 2.

The crude birth rate for all classes did not rise in this region during 1934, but the decline which has continued unbroken since 1921 did virtually stop. This was due to a rise of about one per cent in the birth rate of the native population. Meantime, the rate for the foreign born continued its decline, although somewhat more slowly. It must be remembered that this decline, which has

[10] The rates for the native population are births to native-white mothers per estimated 1,000 native-white females and those for the foreign population are births to foreign-white mothers per estimated 1,000 foreign-white females. The 1935 birth rate for all classes was estimated on the basis of the experience through September.

been exceedingly sharp, reflects in considerable part the fact that each year finds a smaller proportion of the foreign-born women in the most fertile years of their child-bearing period. It is clear, however, that it was the native and not the foreign-born population in which fertility increased.

Table 2. Percentage changes in birth and marriage rates for New York State exclusive of New York City. (Rates shown in Table 1.)

	Percentage Change in Rates	
	1932 to 1933	1933 to 1934
Marriage rate (1931 to 1932, and 1932 to 1933)	− 8.2	+9.0
Birth rates		
Total births		
All classes	− 6.4	− .6
Native white	− 4.7	+1.1
Foreign white	−15.4	−8.4
First Births		
Native white	− 5.4	+4.2
Foreign white	−17.7	−7.3
Second and succeeding births		
Native white	− 4.3	− .5
Foreign white	−14.7	−8.7

The source of the 1934 increase in the fertility of the native population can be seen by separating first births from second and succeeding births. Figure 1 gives the ratios of first born and of later children to the corresponding female populations for the native- and foreign-born whites. The marriage rates are also shown, set one year forward, so that the rate for 1933 appears directly over the birth rate for 1934. It is immediately apparent that the rise in the native birth rate came exclusively from the 4.3 per cent increase in the first births and that this corresponds with a sharp increase of 9 per cent in the marriage rate for 1933. For the foreign-born population, the decline of the rate for the first born was somewhat smaller than that of the rates for second and succeeding children. In both groups the birth rates of the second and succeeding children declined less rapidly, but among the foreign born this decline was still sharp.

It was the native population and not the foreign-born population in which fertility increased, and within the native population it was the first and not the later births that increased. It is difficult

to reconcile these facts with the interpretation that the check in the decline of the birth rate was due to the increased number of persons supported by public relief. New first-born children can scarcely be thought of as more characteristic of relief than of non-relief families.

The New York City experience further supports the suggestion that the reversal in the birth rate did not come primarily from relief groups. Births classified by order are not available, but it is possible to secure the number of births to residents of each of the constituent health areas in the City. A rough classification of the economic status of 305[11] of these areas is also available in the distribution of rents paid by resident families as reported in the 1930 Census. Rents have changed radically since 1930 but the general character of the districts has changed so little that they will serve for a rough separation of the poorest from the more well-to-do sections of the City. On the basis of these data, the 305 health areas have been separated into three groups. In the first, the median rentals were under $45.00; in the second, from $45.00 to $59.00; and in the third, $60.00 or more. The number of births to white residents was obtained for each of the groups for the years 1930 through 1934 and estimated for 1935 on the basis of experience through September.[12] These data have been plotted in Figure 2 on semi-logarithmic scale with the initial points for 1930 superimposed. It is immediately apparent that there was a sharp drop in the number of births in each group from 1930 through 1933. In the poorest districts the decline continued unchecked through 1934 and at a slower rate through 1935. In the intermediate districts, the decline continued through 1934 and 1935 but much more slowly. It was in the high-rent districts that the number of births increased during 1934, and there the reversal was sharp and continued through 1935.

[11] The remaining 6 health areas are, for the most part, parks and cemeteries.

[12] Negro births have been omitted to eliminate the disturbing influence of high rents charged to Negro groups even for slum dwellings.

Much can be said about the lack of statistical precision of such results. At best, health areas are heterogeneous units. Those with high median rentals doubtless contained many slum homes, and those with the lowest medians, some families in comfortable circumstances. No attempt has been made to take into account the changes which have occurred since 1930 either in the size or the age distribution of the population. The data represent simply the number of births. In spite of all this they are convincing as far as New York City is concerned. The medians do serve to differentiate roughly the poorest from the well-to-do districts and, while population shifts have doubtless occurred, the results would be affected only if there had been a considerable movement from the cheapest to the more expensive districts. The conclusion seems inescapable that in New York City it was the well-to-do and those in comfortable circumstances, rather than the poor, who increased their fertility in 1934. This is quite the opposite of the result one would expect if dependency increased fertility.

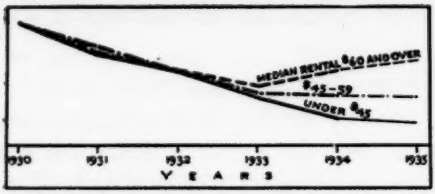


Fig. 2. Trends from 1930 to 1935 in the number of births to white residents of New York City Health Areas grouped by median rentals in 1930. (Data for 1935 are estimated on the basis of monthly returns through September. The scale is semi-logarithmic, and the initial points are superimposed. There are 133 areas with median rentals below $45, 106 with medians from $45 to $59, and 66 with medians of $60 or more. In 1930 the number of births in each group was 52,119; 39,311; and 22,550, respectively.)

In summary, it appears that those who have been viewing with alarm the increased fertility brought on by dependency have probably been exercising themselves over something that did not happen. The direct studies indicate that relief families were more fertile than non-relief families before dependency as well as during it. In upstate New York the increase in first births accounts entirely for the 1934 increase in the birth rates of the native white

population. This is scarcely compatible with a sharp increase in the fertility of dependents. In New York City it was in the well-to-do and not in the poor districts that the number of births increased in 1934 and 1935. Pending further information, such evidence throws a heavy burden of proof on those who assert that dependency increases fertility.

This suggestion, that dependency does not increase fertility, is supported by *a priori* considerations. It is true that fertility is inversely associated with economic status. This does not mean that the poor have many children and the comfortable and well-to-do few children simply because of their respective incomes. The income status affects and is doubtless affected by an entire complex of living standards, attitudes, and customs which are the important factors in determining fertility. A sudden loss of income, even if sustained for several years, is not likely to change established attitudes and standards of one income group to those characteristic of a poorer and more fertile group. Whatever the standard of the group, loss of income means that for that group new babies are a heavier burden than before. The lines of interest set up would therefore lead one to expect a reduction in the fertility of any group in which voluntary control plays a significant part. When the evidence is all in, it may well be found that the fertility of all classes declined during the most acute phases of the depression, but that the decline was sharpest in those self-supporting groups to which both the knowledge and the means of controlling fertility are the most available.

MEASURING THE EFFECTIVENESS OF A TUBERCULOSIS PROGRAM[1]

by JEAN DOWNES

WHEN an area has attained a reasonable standard in terms of activities and services rendered in its program for tuberculosis control, for future planning it is highly desirable to make an internal evaluation of the program's effectiveness. The usual "appraisal form" method cannot be used to measure the effectiveness of tuberculosis work since it is a "yardstick" which relies upon a quantitative statement of the means of executing a program rather than a criterion of the end results.

There are two definite and clear-cut aims in the tuberculosis program toward the accomplishment of which all activities are directed. They are (1) an appreciable reduction in the mortality from tuberculosis, and (2) a decrease in the number of cases of active disease or foci of infection. Both are capable of objective measurement. Data drawn from Cattaraugus County, New York, for the period 1923-1934 will be used to illustrate the practical knowledge which may be derived from a study of progress in the accomplishment of these two purposes of the tuberculosis program.

Cattaraugus County is a rural area embracing thirty-three towns or townships. In twenty-one of these towns the population is composed of 16,228 persons living on farms or in very small villages; in ten of the towns there are some farm families but the population of 22,165 is predominately gathered in villages ranging in size from 1,000 to approximately 3,000 persons. Two towns, which have a population of 10,000 and 23,000 respectively, comprise the two urban areas in the County.

[1] From the Milbank Memorial Fund. Acknowledgments are made to the Cattaraugus County Department of Health, especially to Dr. John H. Korns, director of the Bureau of Tuberculosis, for access to the data used in this study.

Since tuberculosis is a disease transmitted chiefly from person to person through contact, even a small concentration of population would increase the chances of acquiring tuberculosis. Therefore, it seems advisable to show the incidence of disease and mortality separately for each of the population groups, farm, village, and urban, in order to see where the problem of control is greatest. Also, it is of interest to know whether or not the program of tuberculosis control has been equally effective in all of these groups.

Table 1. Average annual incidence of active cases of tuberculosis in 1923-1926 contrasted with the period 1931-1934 for four localities in Cattaraugus County, New York.

Locality	Average Annual Incidence of Active Cases (per 10,000)		Per Cent Change
	1923–1926	1931–1934	
Olean	12.0	6.7	−44.2
Salamanca	10.7	9.9	− 7.5
10 Village towns	12.4	5.8	−53.2
20 Rural towns[1]	10.1	4.3	−57.4

[1] One of the twenty-one rural towns has been excluded since it contains the County Home. Because of insufficient information, it was impossible to allocate to previous residence the very few cases and deaths from tuberculosis which occurred at the County Home during the early period, 1923-1926.

Throughout the twelve-year period under consideration (1923-1934), case-finding and case reporting have been emphasized with such success that even in the rural areas of the County at any given moment of time it is believed that at least 75 per cent of the active cases are known to the Department of Health. Consequently, the new active cases of clinical disease reported or discovered year by year for all these areas may be used for a comparison of the incidence of tuberculosis at various time periods. The mortality may be used in a like manner.

Table 1 and Figure 1 show the average annual incidence of active tuberculosis (all forms) for the two periods 1923-1926 and 1931-1934 for each of the two cities, the village, and the rural towns. In the earlier period (1923-1926) the level of the rate of incidence was similar for all of the areas. It varied from 10 in the farm towns to 12 per 10,000 in the village towns. This was not true of the later period because the incidence has declined unequally in the various areas.

All of the areas, with the exception of Salamanca, show a similar decline in the incidence of active tuberculosis when the period 1931-1934 is compared with the earlier period. The greatest decrease in the occurrence of active tuberculosis (57 per cent) was noted for the farm population; 53 per cent was noted for the ten village towns; and a decline of 44 per cent was evident for the City of Olean. On the other hand, Salamanca has shown no evidence of a change in the frequency of occurrence of active disease. The differences in the incidence rates in the two periods for the three areas (Olean, farm, and village) are statistically significant as they greatly exceed any amount that might result from chance variation.[2]

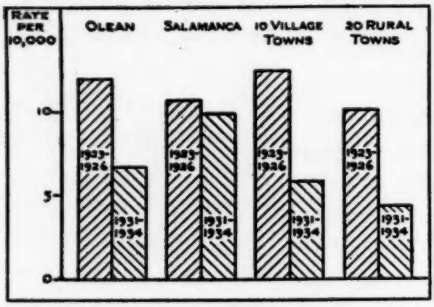


Fig. 1. Average annual incidence of active cases of tuberculosis during the period 1923-1926 compared with that in 1931-1934 for each of the four areas of Cattaraugus County.

In Table 2 and Figure 2 the decline in tuberculosis mortality for each of the four areas is strikingly similar to that noted for the incidence of active tuberculosis. However, the level of mortality for the rural towns with rates of 37 and 18 per 100,000 was considerably below that of the other areas in both periods of time. The average annual mortality for the period 1931-1934 contrasted with that for 1923-1926 declined 50 per cent in the twenty rural

[2] The difference in the annual average rates for Olean is five times its probable error; that for the village is six times its probable error; and that for the rural towns is five times its probable error.

Locality	Average Annual Rate per 10,000		
	1923–1926	1931–1934	Differences
Olean	12.0±0.80	6.7±0.59	5.3±0.99
Salamanca	10.7±1.12	9.9±1.08	0.8±1.56
Village towns	12.4±0.81	5.8±0.54	6.6±0.97
Rural towns	10.1±0.86	4.3±0.57	5.8±1.03

towns, 43 per cent in the ten village towns, and 47 per cent in Olean. On the other hand, Salamanca with a decline of approximately 12 per cent shows relatively little change in mortality.

Table 2. Average annual mortality from tuberculosis in 1923-1926 contrasted with mortality in 1931-1934 for four localities in Cattaraugus County, New York.

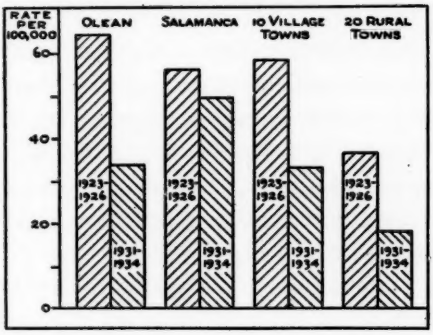
Locality	Average Annual Mortality (per 100,000 Population)		Per Cent Change
	1923–1926	1931–1934	
Olean	67.4	34.0	−47.4
Salamanca	56.2	49.6	−11.7
10 Village towns	58.9	33.4	−43.3
20 Rural towns[1]	36.8	18.4	−50.0

[1] One of the twenty-one rural towns has been excluded since it contains the County Home. Because of insufficient information, it was impossible to allocate to previous residence the very few cases and deaths from tuberculosis which occurred at the County Home during the early period, 1923-1926.

Both Figure 1 and Figure 2 show that at the present time in Cattaraugus County the control of tuberculosis is a problem for the most part confined to the two urban areas and the village towns. They are relatively small areas geographically with a greater concentration of population than in the wholly rural areas. Also in one of the urban areas (Salamanca) the program of tuberculosis control seems to have been ineffective in reducing either the occurrence of the disease or mortality from it.

Since tuberculosis is a disease for which mortality and morbidity are selective both as to age and sex,[3] it is important to discover whether or not the decrease in the disease in the different parts of the County has been uniform in the different sex and age groups. Table 3 shows the average annual in-

Fig. 2. Average annual mortality from tuberculosis during the period 1923-1926 compared with that in 1931-1934 for each of the four areas of Cattaraugus County.



[3] Evidence as to the selectivity of the disease both as to age and sex in this particular area was brought out in the following study: Downes, Jean: The Age Incidence of Tuberculosis and Its Significance for the Administrator. Milbank Memorial Fund *Quarterly*, April, 1935, xiii, No. 2, pp. 152-161.

Locality	1923–1926		1931–1934		Per Cent Change	
	Male	Female	Male	Female	Male	Female
Incidence of active cases (per 10,000)						
Olean	11.1	12.9	8.4	5.0	−24.3	−61.2
Salamanca	9.6	11.9	8.3	11.6	−13.5	− 2.5
10 Village towns	11.2	13.6	6.3	5.3	−43.8	−61.0
20 Rural towns	7.4	12.9	3.9	4.8	−47.3	−62.8
Mortality rate (per 100,000)						
Olean	66.2	63.2	36.5	31.6	−44.9	−50.0
Salamanca	60.8	51.6	36.2	63.3	−40.5	+22.7
10 Village towns	62.6	55.0	43.1	23.0	−31.2	−58.2
20 Rural towns	34.0	39.7	12.9	24.2	−62.1	−39.0

Table 3. A comparison of the change in the average annual incidence of active cases and the mortality from tuberculosis among males and females in the period 1923-1926 and 1931-1934 in different localities in Cattaraugus County, New York.

cidence of active cases and mortality by sex for each of the four areas in 1923-1926 contrasted with the period 1931-1934. The per cent change in incidence has been decidedly greater among females than among males in all of the areas except Salamanca for which little or no change was recorded. The incidence rate among females was from 61 to 63 per cent lower in the more recent period contrasted with the early period. On the other hand, the incidence among males (excluding Salamanca) showed a decline of from 24 to 47 per cent.

In the twenty rural towns the decline in mortality was less among females than among males but in Olean and the ten village towns the mortality among females declined from 50 to 58 per cent in the two time periods compared. These are somewhat greater declines than those noted among the males. The female mortality rate in Salamanca has increased 23 per cent and the male rate decreased 41 per cent.

Figure 3 shows graphically the per cent change in the average annual incidence of active cases at various ages for the period 1931-1934 compared with 1923-1926 for each of the four areas. In general, the greatest decline in the incidence of active tuberculosis

has taken place in the age groups under 25. These are the ages which should reflect most readily the effect of preventive work in tuberculosis. It is of interest to note that Salamanca shows an increase in the incidence of active disease at these ages. No particular significance can be attached to the actual amount of these increases but the fact of no decrease in active disease at these ages is indicative of deficiency in tuberculosis control in this particular community.

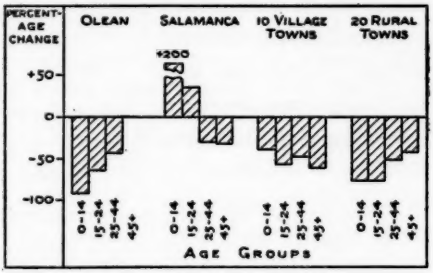


Fig. 3. Percentage change in the average annual incidence of active tuberculosis in 1931-1934 contrasted with 1923-1926 at different ages in each of the four areas of Cattaraugus County.

For future planning these findings would indicate that the tuberculosis problem in this rural County is now confined largely to the two urban areas and the village towns even though appreciable reductions have taken place in both case incidence and mortality in two of the areas. Emphasis should be placed upon case-finding and preventive work among adult males and a special effort should be made to reduce the incidence of active cases among persons over 25 years of age.

In the one urban area, Salamanca, which shows no effect of the intensive anti-tuberculosis work, there is need for careful study as to causes and perhaps an entire reorganization of the program of services. It may require a concentration of effort to enlist better cooperation on the part of the family physicians, or perhaps better supervision and reorganization of the services of the public health nurse. Just as public health personnel and equipment are marshalled to control a typhoid epidemic, so should the tuberculosis program in any department of health be organized with sufficient elasticity to enable the best efforts of the department to be directed to the "sore spots" or points of greatest need.

In conclusion it seems appropriate to point out that the ordinary appraisal of services and activities would not reveal the true situation in Cattaraugus County. For example, in Table 4 is shown the ratio of new active cases to deaths in the two periods (1923-1926 and 1931-1934) for each of the four areas in Cattaraugus County. It is interesting to note that Salamanca ranks equally well with the other areas in both periods and attains the standard set by the "appraisal form" in case-finding in rural areas—yet there has been no progress in that particular area in attaining the objectives for which the tuberculosis program is planned.

Locality	Ratio of New Active Cases to Deaths from Tuberculosis	
	1923–1926	1931–1934
Olean	1.9	2.0
Salamanca	1.9	2.0
10 Village towns	2.1	1.7
20 Rural towns	2.7	2.4

Table 4. Ratio of new active cases to deaths from tuberculosis in four areas in Cattaraugus County for the period 1923-1926 contrasted with that of 1931-1934.

SYPHILIS CONTROL IN NEW YORK STATE[1]

by THOMAS PARRAN, JR., M.D.[2]

TWO CERTAIN facts about syphilis challenge the American health officer. First, there is the continued high prevalence of the disease. Second is its cost not only in terms of community expense, but also in terms of human suffering and, finally, there is the very definite demonstration by certain European countries that the disease can be controlled by medical and administrative measures. Regarding this last point, it is recognized that methods found useful abroad may not be generally applicable in this country, but the fact remains that the prevalence of syphilis may be markedly reduced by a coordinated program of attack. The present article outlines the new program for this purpose in New York State.—EDITORS.

VENEREAL disease control activities have been carried on by the New York State Department of Health for more than twenty years, but because of limited funds it has not heretofore been possible to carry on an entirely comprehensive and satisfactory program. Added appropriations for the control of syphilis, made by the 1935 Legislature, have made it possible to inaugurate an intensive State-wide program. The objectives of this program may be stated as follows: (1) provision for adequate diagnosis and treatment facilities; (2) improvement in case reporting, and the supervision of syphilis cases; (3) intensive and complete investigation of syphilis cases and contacts; and (4) professional and public education in matters pertaining to social hygiene.

GENERAL FEATURES OF SYPHILIS PROGRAM

Administratively, the syphilis-control program is being carried out (1) by city health departments, with State aid, in cities of more than 50,000 population;[3] (2) by five county departments of

[1] From *Venereal Disease Information*, 16, No. 9, September, 1935, pp. 303-308. Reprinted with some revisions by permission of the author and the United States Public Health Service.

[2] New York State Commissioner of Health.

[3] New York City is a separate health jurisdiction by law. The Cities of Buffalo and

(Continued on page 58)

health, with State aid; (3) by State employed personnel in sixteen health districts of the State.[4]

In addition to having direct responsibility for syphilis control in all areas outside of county and large city departments of health, the district State health officers have general administrative control over the programs in the counties and cities.

With the anticipated funds under the Federal Social Security Act it is planned to provide at least a medical officer, a specially trained public-health nurse, and clerical assistance to each district staff; and to subsidize all clinics which meet approved standards. Funds are also being used to aid cities of more than 50,000 population in developing an approved syphilis-control program.

So that expert clinical advice may be generally available, a number of physicians who are specialists in syphilis are to be appointed as part-time medical consultants. These physicians will advise the district officer regarding clinical matters, and will render consultation service to their colleagues in general practice when called upon.

Since it is generally recognized that the prevalence of the disease is greatest in large urban centers, proportionately more funds are to be allocated to cities of 50,000 or more population than to smaller communities. Preference is to be given cities which are willing to increase their own venereal-disease expenditures; in several cities, new sums have already been appropriated sufficient to match State funds on an equal basis.

Rochester are not included in territory under the direction of district State health officers, but are subject to the authority of the State Commissioner of Health.

[4] The State is divided into sixteen health districts, each having a full-time district State health officer who by law is the direct representative of the Commissioner of Health. District State health officers are responsible for local health activities in their respective districts, and with the assistance of suitable medical, engineering, nursing, and clerical staffs exercise supervision over local health officials. Although this plan of operation has not been strictly followed in the past in venereal disease work, the various divisions of the State Health Department in general function through district State health officers, and county commissioners of health. With the exception of the large cities mentioned, the policies of the various divisions of the department are carried out by district State health officers, and contacts with local health officers are usually made through them.

Financial assistance is given only to cities with syphilis programs approved by the State Department of Health. Before entering into a cooperative arrangement with a given city, agreement is to be reached with municipal authorities as to details of the program and budget, the program in each city varying in accordance with local needs and activities, and existing resources both public and private. It is proposed that a bureau or division of syphilis control be organized under a competent director who will be responsible to the city and State Department of Health for the conduct of the syphilis program.

It is also recommended that a medical advisory committee be appointed in each municipality by the city department of health, which committee will include in its membership all directors of syphilis clinics, and any other person having special knowledge of venereal-disease control who may seem desirable. The functions of this committee will be to advise the city health officer on such matters as standards of professional service in approved clinics, eligibility of clinics for approval, coordination of clinic and field activities, and the formulation of special clinical and epidemiologic studies.

For a number of years the State Department of Health has been distributing without charge arsphenamines and other antisyphilitic remedies to physicians in private practice for the treatment of their marginal patients, as well as for the treatment of patients in the clinics and institutions. This policy is being extended to embrace the free distribution of such drugs for the treatment of all patients, thus bringing the policy in reference to these drugs in conformity with the traditional practice in the distribution of biologic products. The method is being further changed to provide for the improved distribution of the drugs locally.

It is hoped that personnel can be made available also to give personal instruction to those physicians who are shown by the records not to be using the laboratory diagnostic services. These

visits also will be the occasion for informing the physician concerning the State program and the assistance which the individual physician can give.

A part of the help which is being offered to private physicians is the service of a qualified public health nurse with special training in this work, who will be available to act as a representative of the physician in following up delinquent patients, seeking sources of infection, and bringing contacts under treatment.

STANDARDS FOR CLINIC SERVICE

At the present time, there are 121 syphilis clinics operating in New York State outside of New York City. Some of these clinics are in large cities, and others in smaller communities under the direct supervision of the district State health officer. Certain general standards for service are to be insisted upon regardless of the size of the place in which the clinic is located.

Although a number of city departments of health heretofore have paid physicians for their services in clinics, this practice has not been universal. Among other elements in the approved syphilis-control program of cities is the requirement that physicians who work in the clinics must be paid for their services. The amount of payment varies, but approximates $10 per clinic period. For this compensation the clinician will be expected to remain in the clinic throughout the clinic period.

These standards of clinic service may be summarized as follows:

Clinics will be conveniently located, and accessible to densely populated areas. The rooms in which clinics are held must be well ventilated, and have adequate space and seating capacity. Separate waiting rooms must be provided for men and women. Treatment and examining rooms must be of ample size and must have all necessary equipment, including facilities for dark-field examinations. Records will be maintained for each case throughout its duration; these records must contain the minimum of information

called for on forms prescribed by the State Department of Health. Clinic records will be kept in files which can be locked.

The plan for the treatment of early syphilis will be continuous and in conformity with modern accepted practice. A spinal-fluid examination will be performed on each patient ready for discharge as "cured" or arrested. Where possible, facilities will be provided for special examinations such as cardiovascular examinations and others for which special apparatus is required.

Each clinic will have a clinic director and a suitable corps of assistant clinicians approved as competent to treat syphilis by the State Department of Health. A sufficient number of clinicians will be available to provide a high quality of professional care. Each clinic must be supplied with adequate nursing and clerical service.

While all clinics need not hold daily sessions, consultation and clinic service must be provided at some point in large cities on each week day, and there should be at least one evening session each week. Immediate treatment for early positive cases must be available daily, and clinics will be required to receive patients irrespective of whether they are residents of the city or not.

The following classes of patients will be eligible for treatment at clinics, irrespective of whether the patient is a resident of the city in which the clinic is located or not:

> Any patient for initial diagnosis and emergency treatment if found to be infectious.
>
> Any patient referred by a physician for consultation, such cases to be returned with examination reports to the physicians referring them.
>
> Any patient unable to pay a private physician for treatment.

Ways and means must be provided in each clinic for determining the financial status of patients applying for treatment. Patients found able to pay will be referred to physicians of their own choice for treatment.

The identity of each new clinic patient will be established. It

will be the duty of the clinic director and staff to make a diligent inquiry concerning the source of infection of each early syphilis case, and the contacts of each patient found to be in a potentially infectious stage of the disease.

Any potentially infectious patient who fails to report for treatment on the scheduled date or for one week thereafter will be reported to the department of health, and investigated either by clinic or health department personnel.

A report will be made monthly by each clinic for transmission to the State Department of Health. The State Department of Health will inspect clinics periodically, and will report its findings to the clinic director and others concerned.

CASE REPORTING AND INVESTIGATION

A reasonably adequate syphilis clinic service embodying most of the features just described has been maintained in New York State for many years, but relatively little emphasis has been placed upon case investigation and other epidemiologic aspects of the problem. Improvement in case reporting and a more intensive search for sources of infection are to be major activities in the new program.

Following the pioneer work of Munson in this State, a sufficient trial has been given to the epidemiologic method for locating sources of syphilis infection to prove its value and practicability under varying urban and rural conditions. The use of epidemiologic methods, therefore, will be the central feature in the control effort.

Through a well-established system of approved laboratories,[5] information is now currently available concerning every new case of syphilis in which a laboratory examination has been made as an aid in diagnosis. The State sanitary code requires that when-

[5] Laboratory service is provided by the central laboratory and its branch in New York City and by a system of approved laboratories throughout the State. Many of the approved laboratories receive aid from State funds.

ever a physician diagnoses or suspects the existence of a case of syphilis an appropriate specimen must be sent to an approved laboratory. Heretofore, positive laboratory reports have been accepted as case reports, but in the future a card report will be obtained for each syphilis case. Approved laboratories require physicians submitting specimens for examination for syphilis to furnish information as to the stage of the disease and as to whether the specimen is for diagnosis or treatment control and other pertinent facts. This information, supplemented by data secured by investigation of sources of infection and contacts, will be used as the basis for a syphilis case register. A separate register will be maintained in each of the sixteen State health districts, in each of the twelve cities of more than 50,000 population, and in each of the five county departments of health. Thus the whole of upstate New York will be covered.

Outside of the large cities and the counties with health departments, physicians will report cases directly to the district State health officer rather than to the local health officer. Copies of every positive laboratory test made in approved laboratories will be sent to the district State health officer or the city or county health officer, and used as a check against case reports. Except in a few cities where local regulations require otherwise, physicians may report cases seen in private practice by number or other identifying symbol if they prefer not to divulge the patient's name.

All cases of syphilis will be classified into three categories: (1) early syphilis, in which less than one year has elapsed since onset; (2) other potentially infectious cases; and (3) late, noninfectious cases.

The term "potentially infectious" is applied to the following types of cases regardless of the presence or absence of visible lesions:

> All patients with acquired syphilis who have received less than twenty injections each of an arsphenamine and a heavy

metal, or equivalent treatment, until five years have elapsed since onset.

All female patients with acquired syphilis who have received less than twenty injections each of an arsphenamine and a heavy metal, or equivalent treatment, until the menopause has been reached.

All patients with early congenital syphilis.

All cases of early syphilis and of potentially infectious syphilis will be investigated. Efforts to determine sources of infection will be limited to early syphilis. Investigation of contacts, however, and supervision of the case will be extended to include also potentially infectious cases.

When a physician reports a case in private practice, the investigator will first go to the physician himself and ask the physician either to permit the health department to investigate the case or to make this investigation himself, in order to locate, if possible, the source of infection. If the physician elects to take responsibility for the investigation himself, he again is given the choice of getting the source of infection and contacts under treatment or of permitting the health department to do it. In the rare instance in which the physician is entirely uncooperative the health department will not communicate with the patient, but will report the facts to the central office.

An epidemiologic record card will be executed for each case of syphilis. This card is comparable in its completeness to those used in investigation of typhoid fever, for example.

No investigation of an early case will be considered complete unless the source of infection is found or unless satisfactory evidence is submitted to establish beyond reasonable doubt that this individual cannot be identified and located.

Responsibility for maintaining a syphilis register for making the epidemiologic investigations for the follow-up of delinquent patients will be carried out by personnel employed by the State

Department of Health and assigned to district staffs, except in cities of more than 50,000 population and county departments of health, where similar responsibility will be exercised by the local department of health with State aid.

EDUCATIONAL ACTIVITIES

It is obvious that a considerable amount of education is a necessary part of such an intensive effort for the control of a major communicable disease as is represented in the current syphilis-control work in New York State. During recent years there has been a constant effort to inform physicians with regard to the better treatment of syphilis and to the importance of this disease as a public health problem. Some of the leading physicians in the State have taken part in this educational effort, which has been integrated with post-graduate medical instruction given by the New York State Medical Society through its committee on public health and medical education. The medical consultants recently employed will continue and extend the campaign for professional education, and will be available also for consultation with physicians in the technical aspects of diagnosis and treatment. These consultants will give public lectures to selected groups.

The training of the personnel necessary to carry on this work has been of importance also. Syracuse University organized this summer a special course in social hygiene for qualified public health nurses. More than seventy nurses are enrolled. During the past year the State Department of Health has been assembling a small corps of well-qualified young physicians, who have been given intensive training both in the general principles of public health and more particularly in the epidemiology of syphilis.

It is proposed also to extend previous educational measures designed to reach the general public, particularly in the age groups most likely to be affected. In this the use of newspaper publicity and advertising and such methods as posting of informative placards in public washrooms and toilets will be used.

THE RURAL PUBLIC HEALTH EXPERIMENT IN TING HSIEN, CHINA[1]

by C. C. CH'EN, M.D., M.P.H.[2]

INTRODUCTION

THIS year a short statement, instead of a full report, is issued for three reasons. First, the year of 1934 was largely devoted to extension of methods that had been worked out in previous years. Very few attempts were made to initiate new activities. Second, the principles and methods of approach underlying the activities of the Department in past years have been discussed at some length in previous reports and to date not enough time has elapsed to justify final conclusions. Finally, a statement of essential facts with graphic illustrations seems to be sufficient to keep our friends informed of the progress of the Department.

The significance of the Ting Hsien experiment, particularly from the standpoint of applying medical knowledge within the socio-economic reach of the population, is recognized by the leading medical schools in the country. In the year 1934, fourteen third-year medical students of the Peiping Union Medical College, eleven fourth-year medical students of the Hsiang-Ya (Hunan-Yale) Medical College, and two internes of the Shanghai Medical College spent in Ting Hsien three days, three weeks, and four weeks respectively. Of three Peiping Union Medical College fourth-year students who selected Ting Hsien for their regular clerkship training, one has joined the field of public health and another is contemplating doing so.

[1] With minor editorial changes, this is the fifth annual report of the Department of Public Health of Ting Hsien, published in Tinghsien, Hopei, China, March, 1935, by the Chinese National Association of the Mass Education Movement under the title, "Statement of Progress in 1934." This report was not available in the United States until November, 1935.

[2] Head, Department of Public Health, Chinese National Association of the Mass Education Movement. The Department of Public Health has received financial and technical assistance from the Milbank Memorial Fund since 1929.

The National Conference on Rural Reconstruction held October 10, 1934, at Ting Hsien was attended by 150 delegates from governmental and private institutions from all parts of the country. A special section of rural health was created and the Department of Public Health of the Ting Hsien experiment was unanimously voted to lead in discussions. The methods of approach in the field of rural health and the underlying principles which have been systematically evolved at Ting Hsien were subject to consideration from different points of view, and, as a result, in general were accepted.

ORGANIZATION

The experience of the last three years has brought out the validity of the present organization which is built upon the village Alumni Associations.[3] With the rapid increase in the number of these Associations more requests are being received for initiation of health activities (Fig. 1). Those villages which have had health workers for two years have realized the value of these workers, and the latter have become a part of the every-day necessity of village life. At present there are eighty village health workers in the Hsien.

Over the village health workers are now eight stations in the subdistricts. Three stations, including one in the City of Tinghsien and two in the surrounding subdistricts of the City, are staffed each with a physician, a nurse, and a dresser. In each of the other five stations there is only a physician and a dresser. All the physicians, except one from the Peiping National Medical College, are graduates of the Hopei Provincial Medical College at Paotingfu, a town fifty miles from the City of Tinghsien. In spite of the fact that the training of these physicians is inadequate for the responsibilities of a subdistrict health station, their

[3] Composed of alumni of the so-called "People's Schools," which have been established in the villages by the Chinese National Association of the Mass Education Movement.

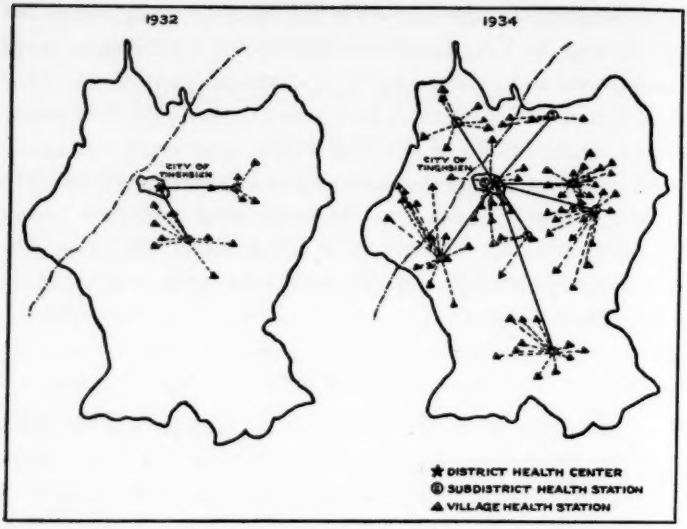


Fig. 1. Comparison of the extent to which local health services were available to residents of Ting Hsien in 1932 and 1934.

youthful minds have proved sufficiently flexible to permit the development of new attitudes and habits. Close connections between the subdistrict stations and the District Health Center are maintained by means of regular telephone service, visits to the stations by members of the Center, occasional shifting of physicians from stations to Center and, most important of all, by regular conference of all physicians of the Department every week-end.

The amount of work in the District Health Center naturally grows with the expansion of subdistrict and village stations. The hospital, the laboratory, and the central supply have proved their value in assisting workers in the field. Experiments in health education methods of "Integrated Village Schools," in teaching farmers to use birth control measures and in immunization against diphtheria with alum precipitate toxoid were carried on by the

members of the Center. In addition to coordinating and strengthening the activities in the subdistrict and village health stations, the District Health Center may in the near future become an important center for the intensive training of rural medical officers.

The following tabulation summarizes the duties and responsibilities of each of the three administrative units:

District (*through Health Center*)
- Administration
- Health education
- Birth control
- Anti-narcotic work
- Sanitation and control of communicable diseases
- School health supervision
- District hospital
- District laboratory
- Training of physicians, nurses, and dressers
- Training of midwives

Subdistrict (*through Health Station*)
- Supervision of health workers
- Popular health education
- School health
- Supervision of village "midwives"
- Preventive vaccinations
- Daily clinic (general)

Village (*through Health Worker*)
- Popular health education
- Reporting of births and deaths
- Smallpox vaccination
- Reconstruction of drinking wells
- First aid (free service)
- Veterinary guidance

VITAL STATISTICS

Aside from the City of Tinghsien, in which an inspector is employed to collect birth and death statistics from various sources, for the Hsien as a whole we still depend upon the village health

workers for statistical information. The eighty villages, with a population of about 120,000, have all begun to report births and deaths, but as most of them started late in the year they are not included in the present analysis. On the other hand, in the experimental area where reporting has been done for more than three years the information has become fairly reliable, and as the information has been obtained by the same persons in the same places for this period it may be worth comparing. As shown in Table 1, the crude death rate for the registration area has decreased during the past three years. One explanation of the greater decline in the death rate in the City, shown in the third part of the table, may be the relatively greater accessibility of health services in the City. The death rates in 1933 and 1934 by specific causes, are shown in Figure 2. It will be noted, that in general the fall of specific death rates occurs in the controllable causes of mortality, while for two consecutive years smallpox has been an insignificant cause of mortality.

Table 1. Crude death rates in the registration area of Ting Hsien, 1932-1934, and birth and death rates in Tinghsien City and in a sample village, 1933 and 1934.

	Per Cent
Crude Death Rates in Registration Area[1]	
1932	31.6
1933	27.2
1934	22.6
Birth Rates[2]	
Tinghsien City, 1933	42.1
Sample Village, 1933	35.7
Tinghsien City, 1934	41.5
Sample Village, 1934	32.4
Death Rates[2]	
Tinghsien City, 1933	32.3
Sample Village, 1933	21.6
Tinghsien City, 1934	25.8
Sample Village, 1934	18.8

[1] Population 22,400.
[2] Population of combined areas 13,800.

HEALTH EDUCATION

The importance of health education in a rural community cannot be over-emphasized. As in the past, this was carried on through various channels:

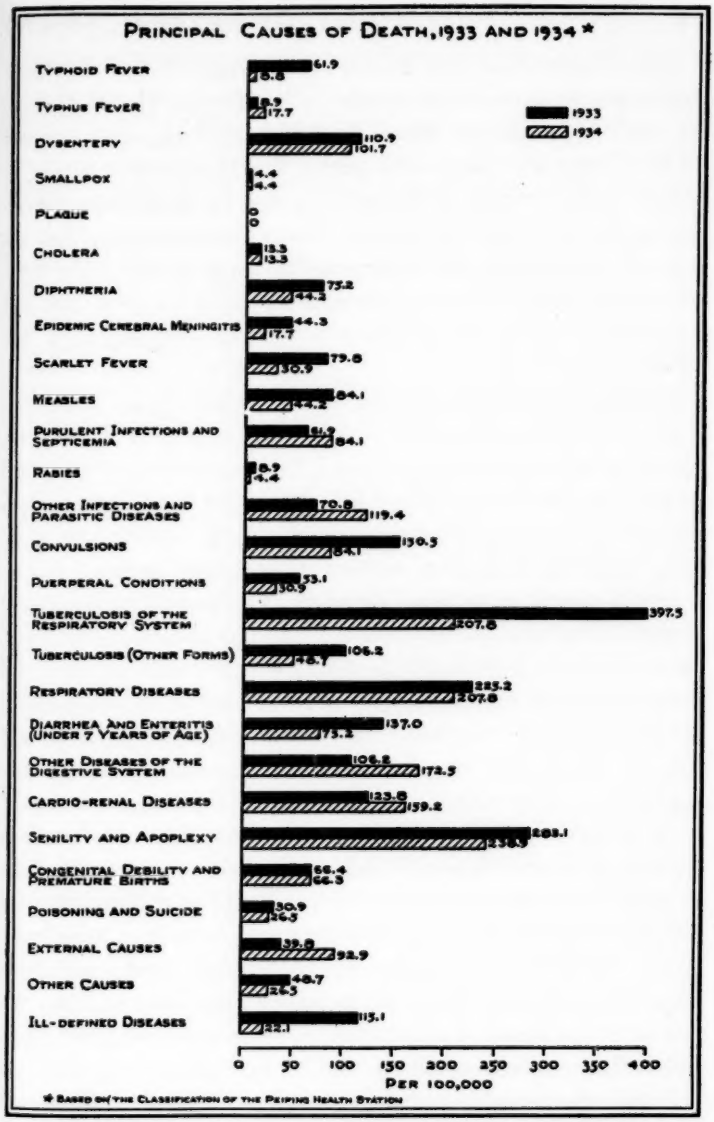


Fig. 2. Deaths from twenty-seven specific causes in the registration area of Ting Hsien, per 100,000 population, 1933 and 1934.

The Chinese New Year Exhibit. In a period of five days over 19,000 people attended the exhibit in the District Health Center. In addition to different devices for health teaching, every quarter of the Center was open to the public. The visitors were struck by the general cleanliness of the building and by the disinfection by boiling of the clothes of patients. Eleven thousand pamphlets on control of smallpox and diphtheria were distributed. Five hundred illustrated booklets on maternal welfare were given out and explanations given to the illiterate women who attended the exhibit.

Colored Posters. Last year every village health worker was given a set of colored posters. Each was held responsible for explaining the pictures to the People's School Alumni and students in his own village. In this way it was found that over 8,000 young adults studied the posters during the year. Today these posters hang on the wall of the work place of every village health worker.

Improvement of Selected Drinking Wells and Latrines. As a means to stimulate the population in sanitary consciousness, forty-seven drinking wells in the homes of village health workers and in a number of primary schools were reconstructed according to approved designs. Seventy-three pit latrines in the primary and normal schools were also remodelled. In general, the Health Department is responsible for only one-third of the expenses incurred.

Cleanliness in School Children. The improvement of general cleanliness among the school children is obvious to every observer. A public bath room was constructed in the District Health Center the latter part of the year. In two months, 1770 free baths were given. Children marched two or three miles to take a bath at the Health Center. The children enjoyed the showers from the kerosene tin boxes so much that each time after bathing they asked their teacher when they could come back!

Health Teaching. In comparison with previous years the attendance of school children at health classes increased greatly during

	1932	1933	1934
Preventive and Curative Services			
Smallpox vaccinations	1,010	3,401	9,148
First-aid treatments by village workers	4,109	22,418	68,624
Treatments given in schools for trachoma	26,435	48,575	95,580
Treatments given in schools for tinea of the scalp	3,444	7,073	26,162
Attendance at Clinics and Health Classes			
At clinics in subdistrict health stations	22,126	26,764	41,929
At health classes in schools	19,819	14,731	49,349
Hospitalization			
Number of patients	224	418	515
Number of patient-days of care	2,771	6,162	7,755

Table 2. Number of specified health services given residents of Ting Hsien, 1932-1934.

the year. This is shown in Table 2. Popular lectures on different aspects of personal and community hygiene were given at twenty-three Spring Fairs held in various parts of the Hsien. It is estimated that not less than 20,000 people listened to these talks which were illustrated with colored posters.

CONTROL OF COMMUNICABLE DISEASES

Smallpox is still the disease to control. In spite of its epidemic form in the surrounding hsiens for the last two years, the District of Ting Hsien has remained more or less free from the disease. The increasing use of anti-smallpox vaccination by the population is also shown in Table 2. In the three-year period, 1932-1934, a total of 31,785 vaccinations has been given. The effectiveness of our technique was tested each year and for the year of 1934 it was found to be 93.1 per cent. In other words, out of 1,175 primary vaccinations there were 1,094 "takes."

A word may be said on the control of communicable diseases in general. The control of epidemics, provided it is carried out on a sufficiently extensive scale, does more to impress the people with the effectiveness of scientific medicine than bedside treatments do. Methods of control must fulfill the following conditions:

They must be cheap. Each vaccination against smallpox in Ting Hsien now costs only 2.5 cents.

They must be extremely simple and, under present conditions in China, safe enough to run the risk of having them undertaken by lay workers.

They must be over 95 per cent effective. Any method which is less effective will fail.

They must not produce apparent constitutional reactions. Local reactions are not objectionable and are, in some cases, welcome. But the public will not forgive marked constitutional reactions.

On the basis of these criteria, we have concentrated our attention on smallpox and have recently begun to extend alum-precipitated diphtheria toxoid. From the difficulties in fulfilling all of the conditions mentioned, one can realize the limitations in the control of many diseases by vaccination. The control of gastro-intestinal diseases through improved sanitation, for instance, can hardly be replaced by specific vaccination, although the latter is generally the first thing thought of in economically difficult conditions. In other words, eradication of important causes of mortality in rural China must take time and patience, and it is ridiculous to attempt to control many diseases at one time under present socio-economic conditions.

MEDICAL RELIEF

Medical relief is generally expensive, and it is difficult to measure results. The tremendous increase in the number of treatments given in the last three years is undoubtedly indicative that the community accepts them and is actually responsible for reducing the cost per treatment. About 50 per cent of the total budget of the Department is devoted to treatment of diseases, both general and specific, which include the chief causes of morbidity such as trachoma and tinea of scalp. In 1934, there were altogether 193,332 treatments given by nurses and non-medical men, 41,929 treatments by physicians, and 7,755 patient days of hospitalization. The

per unit cost of each type of treatment may be estimated as follows:

"Non-medical" treatment: 1 cent per treatment
Physician's treatment: 10 cents per treatment
Hospital treatment: $1.50 a day

On the basis of fifteen days per patient, the average cost of one patient in the hospital is around $23.00. Experience shows that this cost cannot be reduced very much if professional standards are to be adequately maintained.

The availability of medical service to the community may be further illustrated by the types of treatment received by the deceased in the City of Tinghsien before death. In 1932, 81.4 per cent were treated by the old-fashioned methods and but 4.5 per cent received modern medical care. In 1933, the percentage receiving modern medical care had grown to 27.8 per cent, with 48.4 per cent receiving the old-fashioned type of service; while in 1934, 35.8 per cent received modern care and 39.8 per cent the old-fashioned type.

	Trachoma	Tinea of Scalp
1932		
Spring	53.6	17.3
Autumn	28.5	4.4
1933		
Spring	56.9	7.2
Autumn	24.5	4.1
1934		
Spring	45.4	7.2
Autumn	26.8	2.8

The effectiveness of treatments given by non-medical men in the schools may be shown by the decline of the chief causes of morbidity each year.

MATERNITY AND CHILD WELFARE

No other phase of health protection is more dependent upon the general progress of society than maternity and child welfare. Before people begin to appreciate the importance of mothers and children in relation to the welfare of the nation and before the community is rich and intelligent enough to seek technical assistance, it is difficult to expect rapid growth of maternity and child health activities.

Attempts have been made in Ting Hsien to train old "midwives" in the villages during the past four years. Out of the forty trained by members of the District Health Center not more than three are today working honestly without special supervision. One of the three is extraordinarily earnest and she alone delivered forty-five births in the year. In general, supervision of "midwives" in scattered villages is so hard that one may say it is impractical, and midwives working honestly without special supervision are rare exceptions to the rule.

Young women who are related to old midwives present an attractive channel of approach. But their training must be thorough and requires considerable material for practice. Of the four young women who were trained last year, one delivered thirteen babies during the year, the rest only one or two. Time is too short to draw conclusions.

The trained midwife in the District Health Center delivered forty-six babies at a cost of about $5.00[4] per baby. Antenatal and postnatal clinics were carried on as usual.

Since the autumn of 1934, home visits were started in three large villages to teach people how to use birth control devices. Quinine suppository was found to be most convenient for the farmers. Of about 800 families approached, 125 were considered as in need of birth control. Thirty-four of the families consented to use birth control methods and eighteen have kept on using them for the last three months. Very careful records are being kept to find out possible answers to many problems regarding the future of birth control work in the rural communities of the district.

In conclusion, our work in maternity and child health is still in its "trial and error" period. It is hoped that this period will soon pass.

[4] All cost figures are based on Mexican dollars. On the day this article was released for publication, the Mexican dollar was quoted in Shanghai at thirty cents in United States currency.

COST

Sufficient time has passed for the Department to report its per unit cost of organization and activities:

Village Health Station	
Average annual remuneration	$ 6.00
Average cost of drugs and vaccine per worker	10.00
Posters and others	.50
Total cost per worker per annum	16.50
Subdistrict Health Station	
Average salary per station	$600.00
Drugs and other supplies	150.00
Wage of attendant	120.00
Miscellaneous	100.00
Total cost per subdistrict station per year	970.00
District Health Center with a hospital of 45 beds	
Salaries	$12,000.00
Drugs and supplies	2,000.00
Coal, light, and water	2,400.00
Wages	1,600.00
Food for patients	2,000.00
Miscellaneous	1,000.00
Total cost of District Health Center	21,000.00

The per capita cost to the general population may be calculated in the following manner:

For village work—$16.50 per 1,000 people	1.65 cents
For subdistrict health station—$970.00 per 30,000	3.23 cents
For District Health Center—$21,000 per 500,000	4.20 cents
Per capita cost per annum	9.08 cents

DISCUSSION

So far as experimentation in methods of applying medical knowledge in rural China is concerned, it now seems clear that the three parts of a hsien health protection system, *i.e.*, the village health station, the subdistrict health station, and the District

Health Center, are essential. Consideration of the relative importance of these units reveals that the subdistrict health physicians are the key persons of the system. The value of the District Health Center and of the village health workers may be maintained and enhanced provided the subdistrict health stations are functioning efficiently and economically. Without adequate subdistrict stations, the village health workers, because of lack of close supervision and constant encouragement, may lose their interest and confidence, and the District Health Center, because of the difficulties of transportation, will be accessible to only a very small proportion of the population. Consequently, considerable attention was given this year to the study of the subdistrict health stations.

An analysis of the addresses of 10,000 patients who attended the clinics of subdistrict health stations for treatment shows that with the exception of the subdistrict station in the City of Tinghsien, 90 per cent of the patients came from an average distance of 8 to 9 *li*.[5] The station in the City draws patients from a radius of 15 *li* (five miles). In an area which has a diameter of about 15 *li* there are generally twenty-five to thirty villages with a population of about 25,000. A physician in the station of such an area will be able to supervise about fifteen village health workers, conduct a daily clinic for diagnosis and treatment, carry on health education in the community, and lastly give preventive vaccinations. If the schools in the area are included for organized health work, the addition of a trained nurse is necessary. On account of economic difficulties and of inadequate training on the part of the physicians, the proper and full utilization of a nurse by the physician in the station is no easy task. Subdistrict health stations without well-trained nurses probably will be the most popular type of organization in the near future, and this means that the physicians will be the only individuals to depend upon. Thus the question of training physicians to staff subdistrict health stations will be very

[5] One *li* is approximately one-third of a mile.

serious if one wishes to extend a general system of health protection for the country as a whole.

At present, no single medical school in the country is assuming the responsibility of producing physicians for subdistrict stations. The leading medical schools in the country have become so highly technical and specialized that their training cannot be considered as giving the essential minimum for "a practitioner of general medicine in terms of public health." The provincial medical schools, inadequately equipped and staffed at present, must be the logical sources of general physicians in this generation. Unless these provincial medical schools take an interest in the training of needed personnel, there will be no hope of developing rural health work in this country. But, unfortunately, this line of practical thinking is quite a departure from the traditional ways of conducting higher education, and a change of mind toward realities may take a long time.

Therefore, this year special effort was made to develop the best possible relationship between provincial medical schools and the Department. Both the Hunan-Yale Medical College, the provincial medical school of Hunan, and the Paotingfu Medical College, the provincial school of Hopei, reacted very favorably. As one of the results, all the physicians of the subdistrict stations that were established in 1934 were recruited from the Hopei Provincial School.

In view of the obvious inadequacy in the training of the provincial medical graduates, the Department was obliged to offer opportunities in rural health for supplementary training. Observations in Hunan, Shantung, and Kiangsi, where rural health work has been started, bring out the urgency of such training. It seems clear that the Department must try to meet this special need if it has any wish to extend the scheme that has been worked out in the Ting Hsien experiment.

As a matter of fact, many institutions are asking the Depart-

ment to supply them with trained personnel, especially physicians to take charge of subdistrict health stations. If the Department continues to be unable to make positive answers, the experience gained so far in methods of approach will be sterile. One may therefore take the present occasion to call the attention of the readers to the fact from now on the Department will be primarily concerned with the training of medical personnel, supplementary in nature for the time being.

EPIDEMIOLOGY OF WHOOPING COUGH* IN A RURAL AREA

by RALPH E. WHEELER, M.D., D.P.H.

III. HISTORIES OF PREVIOUS ATTACK

IN outlining the method of study, it was observed that at the outset the positive and negative histories of individuals with respect to communicable disease were recorded. As in the case of current attacks, the informant for these histories of past attack in a given family or household was usually the housewife. At the end of the study the histories of each individual were re-checked and it is felt that, particularly for the younger persons, the records are as accurate as it was possible to make them. In the case of whooping cough, positive history data should be more reliable than in the case of diseases such as measles or scarlet fever whose differential diagnosis is more complicated, for the characteristic whoop makes the lay and professional diagnosis of manifest attacks quite simple. The prolonged and sometimes spectacular course is also less likely to be forgotten. It should, however, be borne in mind that this type of information can be no more accurate than the memories of the persons who furnish it.

1. *The Significance of Positive History Data.* The data are important in any study of the epidemiology of whooping cough in part because it is known that a very large proportion of the persons attacked by the disease become immune. Thus of the 280 cases in the present study only thirteen were known to have had a prior attack and in only six was the prior history unknown. For persons under 20 years of age—the group whose histories are considered to be most accurate—the incidence rates are shown in Table 7. The relatively low rate of 2.1 per 1,000 among individuals with positive history indicates a fairly high degree of immunity

* From the Milbank Memorial Fund. The first two sections of Dr. Wheeler's monograph were published in the October, 1935, issue of the *Quarterly*, xiii, No. 4, pp. 366-380.

or, if it is maintained that the immunity conferred by an attack is absolute, a relatively low error in the recording of histories. After the age of 20 years, the value of a positive history as evidence of immunity seems to decline rapidly with age. Seven out of the sixteen cases with known history in this latter group were recorded as having had a prior attack. Whether this is due to inexact recollection on the part of the informant, to the fact that the immunity conferred by an attack is not lasting, or to a combination of these factors, is uncertain.

Table 7. Incidence of whooping cough in persons under 20 years of age according to history of prior whooping cough attack, Cattaraugus County, 1929-1932.

History of Previous Attack	Rate per 1,000	Cases	Person-Years Observed
TOTAL	45.8	260	5,674
Positive	2.0	6	2,950
Negative	97.0	251	2,587[1]
Unknown	21.9	3	137

[1] Person-years of individuals with negative history who contracted whooping cough during the survey were counted as "negative" only until the period of the attack, after which they were counted as positive.

Whatever may be the limitations of positive history data as indices of the immune status of individuals, they do offer an alternative means for studying the prevalence of manifest whooping cough and for checking results obtained by other methods.

The preliminary gross data on recorded histories of attack in the Cattaraugus survey have been presented by Sydenstricker and Collins.[18] These authors give the percentages of individuals who, at the start of the survey were recorded as having had whooping cough, and compare them with similar urban figures with particular reference to Hagerstown. They show that although these percentages increase with age somewhat less rapidly in Cattaraugus than in the City, they tend to reach approximately the same figure for individuals 20 years of age and over.

When the history data for Cattaraugus were later checked with the informants in each household, there were slight changes and,

[18] Sydenstricker, Edgar and Collins, Selwyn D.: Age Incidence of Communicable Diseases in a Rural Population. *Public Health Reports*, United States Public Health Service, January 16, 1931, xlvi, No. 3, p. 100.

for this reason, as well as to give more detailed figures, the percentages of individuals who at a given age were recorded as having had whooping cough at any time prior to that age are presented again in Table 8.

The manner in which the percentage with positive history of attack at age 20 may be used in checking the observed incidence has been outlined above. A more detailed comparison may be made, as Henderson[14] and Collins[15] have shown, by either differencing the positive history percentages at each age and comparing the resulting figures with the age-specific incidence expressed in per cent, or by cumulating the latter and comparing it with the history percentages age by age. The method of cumulating the observed incidence has been followed in the first column of Table 8 and compared graphically with the curve of positive history percentages in Figure 4. Because the history data center on the stated age, whereas the incidence data center between the given ages, the correspondence between the two is more evident in the graph than in the table. It will be seen that the history figures are in general somewhat below the cumulated incidence, but that they show a fair agreement at the younger and older ages. Discrepancies may be due to one or more of three possibilities: (1) an incidence above the normal for the period of the survey; (2) a recent trend toward a younger age-incidence; and (3) a tendency on the part of the informants to understate the histories at younger ages. In explanation of the differences, under the age of one year, it should be recalled that whooping cough tends to recur in cycles and that infants might be expected to show relatively small proportions with prior history just before an epidemic occurrence. Such differences should, however, not persist for as long a period as the differences between these two sets of figures do.

[14] Henderson, E. C.: A Census of Contagious Diseases. *American Journal of Public Health*, September, 1916, vi, No. 9, p. 971.

[15] Collins, S. D.: Age Incidence of the Common Communicable Diseases of Children. *Public Health Reports*, United States Public Health Service, April 5, 1929, xliv, No. 14, p. 763.

Age	Cumulated Observed Incidence[1]	Per Cent with Positive History	Number with Positive History	Number with Known History
0		2.0	1[2]	50[2]
	7.3			
1		8.9	8	90
	14.9			
2		18.2	18	99
	20.6			
3		22.8	21	92
	28.7			
4		29.3	29	99
	35.3			
5		27.7	33	119
	42.6			
6		35.9	33	92
	47.2			
7		52.2	48	92
	56.6			
8		48.0	49	102
	64.4			
9		55.9	57	102
	67.9			
10		65.9	60	91
	72.0			
11		71.9	64	89
	76.1			
12		66.3	61	92
	77.2			
13		76.3	71	93
	79.3			
14		77.4	65	84
	82.5			
15		69.7	62	89
16		80.3	57	71
17		79.6	74	93
	83.4			
18		85.4	41	48
19		82.5	52	63
20–24		79.5[3]	225	283
	83.4			

[1] The cumulated incidence figures are offset slightly to indicate the somewhat different age base for incidence as compared with history data mentioned in the text. The incidence data are for age as of last birthday while the history data are for age as of nearest birthday, and, therefore, six months younger.

[2] Average age three months.

[3] History data tend to show declining percentages at later ages presumably because an early attack is forgotten.

Table 8. Per cent of persons in the surveyed population at specified ages for whom a history of an attack of whooping cough prior to the beginning of the survey was obtained and comparison with cumulated observed incidence per hundred, Cattaraugus County, 1929-1932.

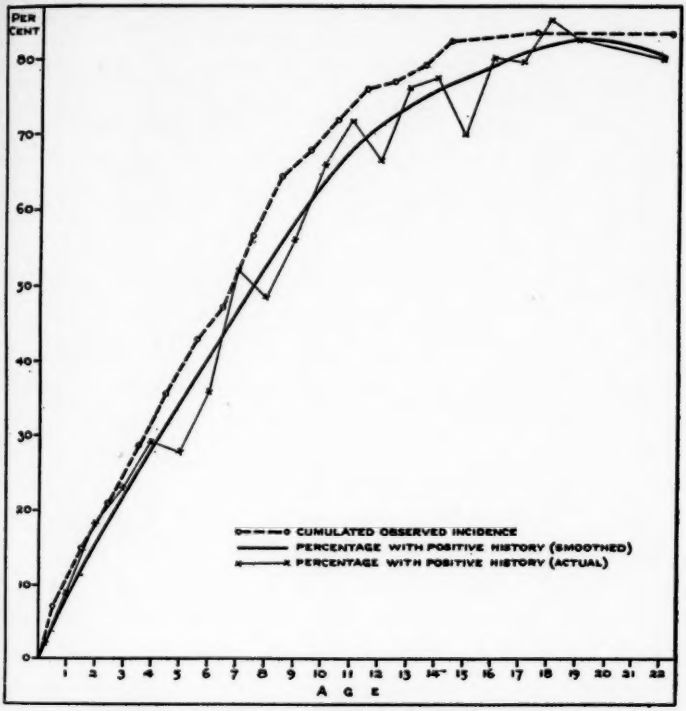


Fig. 4. Comparison of per cent of persons with positive history of whooping cough and cumulated incidence (per hundred) at ages under twenty-five years, Cattaraugus Morbidity Survey, 1929-1932.

It is evident that the history and observed incidence data do not entirely agree and that further information is needed to explain the lack of correspondence. The history data do show, however, certain detailed epidemiological facts which agree with the incidence observations. Thus the older age incidence of Cattaraugus whooping cough in comparison with that in Hagerstown is indicated by the slower rise of the rural history percentages with advancing age, a fact which was, as has been said, pointed out by Sydenstricker and Collins.[16] It was noted above that these differ-

[16] *Loc. cit.*

Age	Village Population			Farm Population		
	Per Cent with Positive History	Number with Positive History	Number with Known History	Per Cent with Positive History	Number with Positive History	Number with Known History
ALL AGES	58.8	299	508	54.4	830	1,525
0– 4	14.0	16	114	19.3	61	316
5– 9	43.1	50	116	43.5	170	391
10–14	81.8	90	110	68.1	231	339
15–24	85.1	143	168	76.8	368	479

Table 9. Per cent of persons in the farm and in the village surveyed populations for whom a history of an attack of whooping cough was obtained prior to the beginning of the survey, August, 1929.

ences in age-incidence associated with concentration of population could be demonstrated in the area itself, the farm sections tending to have an older age-incidence than the villages. This same fact may be deduced also from the history data as shown by the slower rise of the "farm" percentages in Table 9 and Figure 5.

A further corroboration of the incidence data is found when the percentages with positive history are obtained by sex, as has been done in Table 10. Here the same slight but fairly consistent differences are noted as in the observed sex-specific incidence rates. Henderson[17] and Collins[18] by similar studies on histories of school children have shown a slight but consistent excess of percentages with prior history in females.

It may be concluded that the history data in Cattaraugus rather closely parallel the observed incidence data. It should be observed, however, that unusual care was exercised in recording and checking the histories of attack. Possibly very advantageous conditions for collecting the information have minimized the errors which others have found in this type of data.[19] Properly carried

[17] *Loc. cit.*

[18] Collins, S. D.: Past Incidence of Certain Communicable Diseases Among Children. *Public Health Reports,* United States Public Health Service, June 27, 1924, xxxix, Part I, p. 1553.

[19] In an article on the control and prevention of whooping cough (*The Medical Officer,* October 20, 1923, p. 181), Sajet and Gelderen note that the information obtained from an *enquete* of school children seemed unreliable.

out, this form of study will be found to give far more useful results than do the official notification figures as ordinarily obtained in this country, and the expense of conducting such a study is, of course, considerably less than that of periodic house-to-house canvass to determine current incidence.

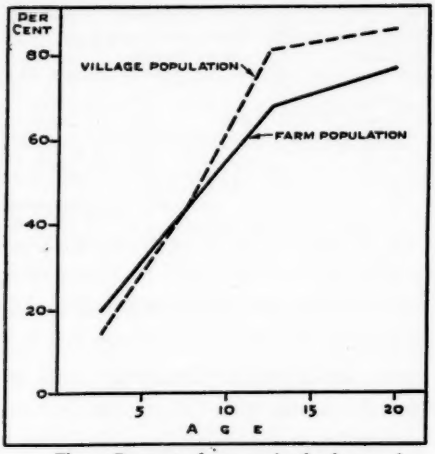


Fig. 5. Per cent of persons in the farm and in the village surveyed populations for whom a history of an attack of whooping cough was obtained prior to the beginning of the survey, August, 1929.

2. *The Significance of Negative History Data.* If the positive history at ages under 20 years may be accepted as an indication of immunity, it cannot be so definitely stated that a negative history is good evidence of susceptibility. Sydenstricker[20] has observed that there appears to be an immunizing factor, aside from an overt attack of whooping cough, which becomes increasingly manifest with increasing age. The evidence for this is found in the fall of the incidence rate for persons without previous history of whooping cough in attacked families in Hagerstown from 90 per cent at early ages to 25 per cent at ages 13 and 14 years.

Stocks[21] has given evidence to suggest that there may be a "temporary latent immunity" in some persons with no history of attack, and he also mentions a possible "inherent immunity" in such individuals, which is, presumably, permanent. The evidence

[20] Sydenstricker, E.: Effect of a Whooping Cough Epidemic Upon the Size of the Non-Immune Group in an Urban Community. Milbank Memorial Fund *Quarterly Bulletin*, October, 1932, x, No. 4, pp. 302-314.

[21] Stocks, Percy: On the Epidemiology of Whooping Cough in London. *Journal of Hygiene*, 1932, xxxii, p. 581.

Age	Males			Females		
	Per Cent with Positive History	Number with Positive History	Number with Known History	Per Cent with Positive History	Number with Positive History	Number with Known History
ALL AGES	54.9	595	1,083	55.2	534	950
0–4	17.6	39	222	18.3	38	208
5–9	42.3	115	272	44.7	105	235
10–14	72.1	173	240	70.8	148	209
15–19	75.5	157	208	82.7	129	156
20–24	78.7	111	141	80.3	114	142

Table 10. Per cent of persons of each sex in the surveyed population for whom a history of an attack of whooping cough prior to the beginning of the survey was obtained, August, 1929.

for the temporary immunity is found in variations in the ratio of secondary to total cases in attacked households and in the subsequent incidence of whooping cough in children with no history of prior attack who escape infection when it first occurs in their households.

The use of the term "susceptible" as a designation for those with no history of attack may, therefore, appear ill-advised. However, it should be noted that both the observations of Sydenstricker and those of Stocks were made on children in urban families. The secondary attack rates of the households in Cattaraugus, to be given below, suggest that relatively few of these rural children under 15 years of age in an attacked household escape the disease if they have never before had it. It should also be observed that there is relatively little decline in the attack rates shown in Table 5 until after the fifteenth year. The age incidence of the immunity noted by both these writers would appear, like the age incidence of overt attacks of whooping cough, to be somewhat retarded in Cattaraugus. The convenient term of "susceptible" is, therefore, retained for these children although it is not one which can be generally used.

The proportion of "susceptibles" at the beginning of each of

the six-month periods of the study is known. The variations in this figure for children under the age of fifteen years in the area as a whole as well as in the villages and on the farms are given in Table 11, and shown graphically in Figure 6 together with the total cases occurring in each six-month period. The two largest villages in the area were both attacked within the first year so that the percentages fell quite rapidly in the village population. Outbreaks in the farm population were less extensive, being usually confined to portions of townships, so that the general level of the farm percentages was more uniform.

Although outbreaks of whooping cough were seldom limited by civil boundaries, the proportions of "susceptibles" in smaller subdivisions of the area may be found of interest. Ashford and Ellicottville townships had not, in general, been attacked for several years and showed very similar percentages when the survey began—65 per cent in the farm areas and 55 per cent in the villages. During the outbreaks of the first year these fell in Ashford to 48 and 35 per cent respectively, and in Ellicottville to 50 and 40 per cent. Although Ashford was, in proportion to its population, more severely attacked, it underwent another epidemic before the end of the survey which brought the percentages down still further. Ellicottville, on the other hand, showed slowly rising percentages until, at the end of the study, practically the original

Table 11. Percentages of "susceptibles" under fifteen years of age recorded at six-month intervals in the survey area as well as in the farm and village sections, Cattaraugus County, 1929-1932.

Interval	Area as a Whole	Farm Sections	Villages
August 1, 1929	56.2	56.2	56.4
February 1, 1930	52.6	52.2	54.2
August 1, 1930	49.6	52.3	38.8
February 1, 1931	50.0	52.4	40.6
August 1, 1931	54.0	56.1	45.8
February 1, 1932	54.2	56.0	47.0
August 1, 1932	50.0[1]	52.0[1]	45.0[1]

[1] Figures at the very end of the study were estimated.

figures were reached. It then experienced another outbreak after the survey was completed.

Humphrey, a purely farm township, had been attacked two years before the survey started and showed a "susceptible" percentage of 55—a somewhat lower figure than that of the farm sections of the two foregoing townships. As no cases were recorded here at any time during the study, this area showed steadily rising figures until, at the end, they had reached 65 per cent. Humphrey was attacked again a year after the close of the survey.

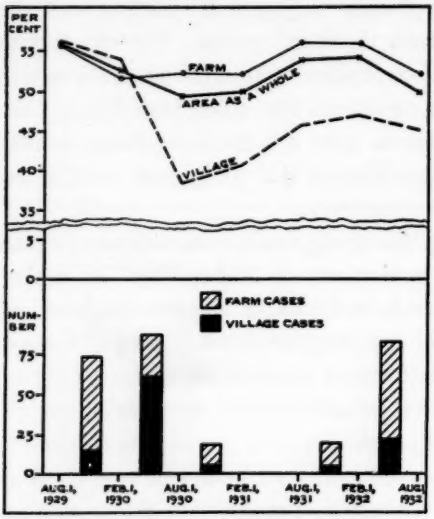


Fig. 6. Percentages of "susceptibles" under fifteen years of age recorded at six-month intervals in the survey area as well as in the farm and village sections, and number of cases in each interval, Cattaraugus, 1929-1932.

Great Valley and Mansfield, both largely farm townships, had had several outbreaks a few months before the beginning of the survey and both showed initial percentages of 48. In both there occurred sporadic localized outbreaks, rather more in Mansfield than in Great Valley, so that the terminal figures were 50 per cent and 55 per cent respectively.

The farm areas were seldom able to maintain for long "susceptible" percentages above 60 or 65, and outbreaks would reduce these to 45 or 50 per cent. Village percentages above 50 were seldom maintained and the figures here, following outbreaks, would sometimes fall to 35 per cent. As outbreaks in villages were more likely to be generalized than those in farm sections, a difference

in the level of percentages in the two types of population might be expected. This may be one factor in determining the older age incidence of farm cases.

In the small city of Hagerstown, Sydenstricker[22] observed that the percentages of "susceptibles" fluctuated between 33 and 41 per cent. These figures are evidently still lower than the villages ones quoted above. It is obvious that the prevalence of whooping cough in a community is by no means solely related to the proportion of "susceptibles" in it. Other factors undoubtedly have to be considered, and among these, the possibilities for contact or the relationship of individuals to one another would appear to be of the greatest importance. These will be reviewed, so far as the data permit, in the ensuing section.

[22] *Loc. cit.* The method followed by Sydenstricker in determining the percentages at six-month intervals was to add to the initial figures for "susceptibles" the births in the interval and subtract the cases, deaths, and children reaching the fifteenth year. The same adjustment was made of the present data. Sydenstricker subtracted an additional one-fifth of the cases because that number appeared to have acquired immunity without overt attack. This last step was not taken in the present instance because, as explained above, the factor of immunity without overt attack did not appear in the Cattaraugus data until considerably later than in Hagerstown. The figures are changed only 1 or 2 per cent when this last subtraction is made.

(*To be continued*)

ANNOTATIONS

"RHEUMATISM" AND ARTHRITIS

"RHEUMATISM," as a subject for review does not sound like the happiest of prospects. To the layman the term may well suggest dark days, wet feet, and mustard plasters. To most practicing physicians also come impressions which are no brighter, for the term "rheumatism" includes a group of diseases which are difficult to classify, difficult to understand, and very difficult to treat. Neither do thoughts of these diseases gladden the hearts of public health workers for, as yet, there is little knowledge which can be practically applied for their control or prevention. This is the pessimistic side of this problem. For the optimistic side, we have to turn to that well-worn and over-worked dictum that rheumatism is a challenge to the medical profession in much the same manner as is cancer. It presents a long list of problems which seem to demand solution and, to say the least, the efforts of those who have tried to solve some of them should arouse our respect and interest.

Some idea of the havoc wrought by these diseases may be gained from the estimate that: "Chronic arthritis, the most common form of 'rheumatism,' is the greatest single cause of disability in temperate climates, and it produces more pensionable invalidism than any other condition except cardio vascular disease in old age." The extent of this menace to human health has been recognized by an international body known as the *Ligue Internationale contre le Rhumatisme,* in affiliation with which the American Committee for the Control of Rheumatism has been working. In spite of the large amount of work which has been done in the United States, Canada, and Great Britain, no systematic review of the existing literature on the subject has been available in the English language. To meet this need, the American Committee recently arranged for the preparation of a synopsis of the significant

current English and American papers on "rheumatism" and arthritis.[1]

Primarily, we cannot consider the subjects covered by this synopsis or review without defining the term "rheumatism." This vague word has been used for four hundred years by physicians who wanted a blanket term to cover certain aches and pains involving muscles, tendons, and joints. Joint afflictions had, of course, been recognized for more than four hundred years, and have been designated as such by the more specific term arthritis. But, when confronted with a patient complaining of pain in the shoulders or knees, both ancient and modern physicians have often experienced difficulty in deciding whether the trouble was actually within the joints, around the joints, or in regional muscles, nerves, or tendons. Some word or diagnostic term seemed necessary to cope with situations of this kind, and, as a result, the broader term "rheumatism" was coined. It was rapidly accepted and is now a household word because it seemed to satisfy the patient's concern and the doctor's conscience. In fact we cannot yet afford to eliminate the word "rheumatism" because the conditions to which it refers are still sufficiently obscure to require a vague or blanket term.

In the review by the American Committee, the list of different conditions or illnesses which now fall under the terms "rheumatism" and arthritis is a long one, including about thirty major conditions and many variant types of these major groups. The proper arrangement of these conditions in any given classification has represented a difficult task and of this fact the authors have been well aware. They state: "Just as with religion, politics, or prohibition, the subject of the nomenclature and classification of the chronic arthritides arouses vociferous, even acrimonious debate." It may suffice to say that their classification and differentiation of these various kinds of "rheumatism" or arthritis, has been based as far as possible upon the types of underlying disease. This is not entirely satisfactory, but it singles out certain conditions which by virtue of their cause being known may be eliminated from the present discussion. Tuberculosis of the bones, for instance, may penetrate into the joints thus giving rise to a specific type of arthritis, so-called tuberculous arthritis. Similarly, certain other known infections may produce their own specific types of arthritis, their nature and

[1] Hench, P. S.; Bauer, W.; Fletcher, A. A.; Ghrist, D.; Hall, F.; and White, P.: The Present Status of the Problem of "Rheumatism"; A Review of Recent American and English Literature on "Rheumatism" and Arthritis. *Annals Internal Medicine,* April, May, and June, 1935, 8: pp. 1315, 1495, and 1556.

treatment, whether curative or preventive, being dependent upon the causative disease. We will not be concerned here with this group, our present interest in the subjects reviewed being rather with a group of so-called non-suppurative types of arthritis, in most of which, little is known of the underlying disease. Of these there are six or seven major conditions which by and large represent most of those illnesses embraced by the terms "rheumatic conditions" and "rheumatism" as they are employed in this country.[2] These conditions are:

Traumatic diseases of the joints
Rheumatic fever
Chronic arthritis
  Atrophic arthritis
  Hypertrophic arthritis
Gout
Fibrositis

Actual figures on the prevalence of the conditions in this list, collected by authors from different parts of the world, will not be transcribed, for, owing to the present lack of generally accepted diagnostic standards, they are probably not very accurate, and furthermore they cannot be readily interpreted unless related to statistics dealing with the local prevalence of other diseases. From the sickness survey conducted in Hagerstown, Maryland, it was found that rheumatism was responsible for more illnesses than any other disease of long duration, and this would seem to be a generalization which might well hold within most temperate climates. There is no question as to the large amount of disability produced by these conditions. This is partly due to the chronicity, or long duration of the attacks, a characteristic of conditions associated with lesions involving bones or their adjacent tissues. It is also due to the obvious fact that any mild disease producing lesions, however slight, which interfere with bodily movements is markedly incapacitating; and by no means the smallest part of this state of incapacity is the feeling of frustration that goes with it.

Besides the disabling features there are certain other features which most of these non-suppurative types of arthritis have in common. Mention has already been made of the fact that as a group their cause and nature is poorly understood and in several, one encounters the same

[2] The use of the term "rheumatism" may have a different connotation in England for *acute rheumatism* is the term employed in that country to designate rheumatic fever.

interminable difficulties in deciding whether they are infectious or metabolic in nature. Another feature is the fact that exposure to cold damp weather predisposes in some unknown way to several of these conditions. As such, their prevalence is increased in temperate, as opposed to tropical climates, particularly among industrial workers who are exposed to dampness. Still another common feature (and this also applies to the suppurative arthritides) is the fact that trauma or injuries as from a blow or strain often seem to be direct or indirect factors in precipitating symptoms.

Brief descriptive notes of the six conditions from our list follow. They represent an abstract of the more detailed information in the original review.

Traumatic Rheumatism. This is not a sharply defined set of conditions, for, although trauma from single or repeated minor injuries, or strains associated with abnormal posture plays an important rôle in producing arthritis, it may also aggravate an already existing arthritis. Thus it becomes an indirect factor in a variety of types of arthritis such as suppurative arthritis following osteomyelitis, the acute arthritis of rheumatic fever, and hypertrophic arthritis. Interesting experiments have recently been performed to show that if an injury to a joint involves the cartilage (the most vulnerable tissue of the joint) and the joint continues to function, then hypertrophic arthritis will ensue. It is nature's method of "healing" (or responding to the injury of) a delicate tissue which is difficult to repair.

Types of traumatic rheumatism which are considered the direct result of occupational and recreational strain include, "housemaid's knee," "tennis elbow," et cetera. Here something has already been accomplished in the line of prevention, perhaps more than in most other types of "rheumatism." Such preventive measures have been developed in various industries and deal for the most part with questions of clothing, advice of a general hygienic nature, and protective devices to relieve trauma during the performance of specific types of labor.

Rheumatic Fever. (*Synonyms:* Acute Inflammatory Rheumatism, Acute Articular Rheumatism, et cetera.) This is an important and well-known disease, common in temperate climates. It is differentiated from most of the other types of rheumatism under discussion by virtue of the fact that it attacks individuals of a younger age and that it is more obviously a systemic disease of which joint symptoms are a local but spectacular manifestation. The joint involve-

ment in rheumatic fever is not serious and although symptoms may persist for months joints are seldom permanently damaged. On the other hand a much more serious aspect of rheumatic fever exists in the heart disease which so often accompanies it.

Rheumatic fever presents problems which are a little different from other types of "rheumatism," in the same manner that tuberculous arthritis also presents problems which are peculiarly its own. Its highest prevalence is found among the poorer classes of people living within cities, but there is no explanation as to why this is so. It is probably an infectious disease in which streptococci play direct or indirect rôles in precipitating its active phases. Very little has been accomplished in the way of controlling its prevalence but a great deal of work on the influence which climate, diet, and sanatorium care may have on the course of the disease is now in progress.

Atrophic Arthritis. (*Synonyms:* Infectious Arthritis, Rheumatoid Arthritis.) This serious and common condition may appear at any age, but generally does so between the ages of 20 and 40. The majority of young adult and middle-aged individuals who are "crippled for years from arthritis" suffer from this type of illness. It is a very chronic condition with periods of quiescence and activity. Associated and often preceding the insidious development of joint symptoms are evidences of mild systemic disease such as loss of weight, fatigability, and nervous irritability. Sometimes the course of the disease may be short and there may be no residual disability, but on the other hand it is one of the most disabling of the arthritides, in that destruction, deformity, and permanent loss of motion of joints may result. The type of damage inflicted consists in thickening of the joint lining and decalcification of the underlying bone. The cause and nature of these lesions have so far resisted elucidation in spite of the enormous amount of effort which has been expended in that direction (twelve pages in this review are devoted to various etiological theories). The care and treatment of patients suffering from this condition is one of the most difficult in the field of medicine and in emphasizing the magnitude of the therapeutic problem the reviewers have justifiably quoted the slogan, "Know arthritis and one knows medicine." Unfortunately the disease is generally well under way before it is recognized and this is always a handicap to the physician. No attempt will be made to review the long list of procedures which are either considered harmful or of value in the treatment of

atrophic arthritis (twenty-one pages are devoted to it in this review).

By and large the impression gained from this part of the review tends to dispel the pessimistic view held by many patients, indeed by many physicians that, "Nothing can be done for atrophic arthritis." Good results have been obtained by various means. However, it does not seem as if quite so much weight were being placed upon the administration of vaccines or the removal of "foci of infection," such as teeth and tonsils as there would have been if this review had been written a decade ago. A word may be said about clothing and climate. The statement is made that arthritic patients tend to wear heavy underwear and extra clothing in an effort "to keep out the weather," thus tending to induce a sodden condition of the skin. Light, porous, and loose-fitting clothing is a therapeutic recommendation. From the data at hand it is difficult to determine the value of a warm and dry climate in relieving arthritis, but it may play a more obvious rôle in prevention than cure. A striking absence of arthritis has been reported among Indians of the Tucson Desert. The field of prevention in this disease is, however, certainly still undeveloped.

Hypertrophic Arthritis. (*Synonym:* Osteo-arthritis.) This is essentially the "rheumatism" of old age, rarely appearing before the age of 40. It is a relatively benign condition in comparison to atrophic arthritis but the acute disability it produces may be very appreciable. The character of the damage consists of degeneration of the cartilage and proliferation of bone about the margins of the joint. Such lesions do not usually go on to cause actual immobilization of joints except to some degree in the spine, where bony spurs may coalesce and thus bridge the gap between individual vertebrae. The nature of hypertrophic arthritis is probably bound up with the physiology of senescence. Preventive measures are unknown.

Gout. From the section dealing with gout we learn that it had been looked upon as "an almost extinct disease" until Hench and others called attention to the fact that it is more common than is usually believed, many cases being missed through mistaken diagnoses. Gouty arthritis is said to be the only definitely recognizable form of "metabolic arthritis," that is, arthritis due to deranged physiological processes rather than to infection. It results, in part at least, "from a disordered purine metabolism" and as such an important part of its treatment and prevention is dietary.

Fibrositis. (*Synonym:* Muscular Rheumatism.) As both of these names imply, this condition does not affect joints *per se*, but the

former name is preferable because it is an affliction of fibrous tissue which may be localized anywhere in the body although it is particularly common around the joints. Various writers include under fibrositis such manifestations as lumbago, wry neck, et cetera. It is perhaps the commonest form of "rheumatism" and although the least serious, it may temporarily be very incapacitating. "With atrophic and hypertrophic arthritis it makes up the three great types of chronic rheumatism," representing from 10 to 55 per cent of the cases of "rheumatism" encountered in clinic or other types of practice. It is more common among men than women, and among miners and outdoor workers than others. Its pathogenesis is obscure but exposure to cold and dampness are recognized as predisposing factors. Methods of handling these cases fall along the same lines as in atrophic arthritis. Nothing is mentioned as regards its prevention.

J. R. PAUL, M.D.

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FIFTY FRUITFUL YEARS

SIR ARTHUR NEWSHOLME's latest work[1] bears the sub-title, "A Personal Narrative with Comments," but it is by no means a biography in the ordinary sense of the term. It corresponds to Duclaux's PASTEUR rather than Vallery-Radot's. It is the precious concentrate of a long life of inspiring leadership in the field of public health; but the word "Newsholme" does not appear in the index of proper names.

This volume carries the story up to 1909, including the period when the author served as Medical Officer of Health for Clapham and Brighton and up to his appointment as the Chief Medical Officer of the Local Government Board. The first chapters include excellent thumb-nail sketches of certain pioneers who directly or indirectly influenced the public health movement in the late Nineteenth Century such as Chadwick, Simon, Farr, Southwood, Smith, Budd, John Snow, Benjamin Ward Richardson, and Pettenkofer. Later sections deal with three major public health problems, the control of infectious disease (in particular, scarlet fever, diphtheria, typhoid, rheumatic fever, and tuberculosis), vital statistics as a basis of public health work, and the safeguarding of development and growth. In each of these fields, News-

[1] Newsholme, Sir Arthur: FIFTY YEARS IN PUBLIC HEALTH. Vol. I. London, George Allen and Unwin, 1935. 415 pp. 15 *shillings*.

holme traces the evolution of our modern viewpoints, citing in detail evidence accumulated from his own rich experience. To the student of the history of public health this volume will prove invaluable and to every worker in the field the study of its pages will bring a stimulated critical faculty and a keener insight into the problems of the present day.

C.-E. A. WINSLOW, DR. P.H.

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NEGRO INTELLIGENCE AND SELECTIVE MIGRATION

HOWEVER scant our knowledge on the subject of selective migration, the question is very important when we consider (1) the increasing urbanization of the population and (2) that birth rates in cities are too low to maintain the urban population. If the cityward migration tends to remove the most able individuals from rural areas and to place them in urban districts where birth rates are low, the process is one which will affect at least the cultural heritage of the next generation. If hereditary factors are involved, the problem runs deeper and is of more lasting consequence.

There is no doubt of the selectiveness of migration in respect to easily ascertained facts such as age and marital status. Occupational selections are sometimes inherent in specific migrations. However, evidence is sketchy on the question of selectiveness with regard to mental ability in its social or biological ramifications.

Without essaying a general answer to the above question, Klineberg's NEGRO INTELLIGENCE AND SELECTIVE MIGRATION[1] presents an interesting and concise account of the methods used and results secured from studies of migrant and non-migrant Negroes. The army tests and intelligence tests administered to school children are fairly consistent in their indications that northern Negroes score higher in intelligence tests than do southern Negroes. Is this condition attributable to selective migration? Is it attributable to a more favorable environment in the north? These questions constitute the twofold problem with which Dr. Klineberg's study deals.

The author first studied the school records in Nashville, Birmingham, and Charleston (South Carolina) in order to ascertain whether those children who had migrated north were superior or inferior when com-

[1] Klineberg, Otto: NEGRO INTELLIGENCE AND SELECTIVE MIGRATION. New York, Columbia University Press, 1935, 66 pp.

pared with the total Negro school population in those cities. Comparisons were made with respect to average marks on subjects and with respect to age-grade standing in school. In order to minimize variations due to the subjective nature of "marks" given by teachers and to the possibility of recent improvement of school facilities for Negroes in those cities, the scores tabulated were determined by the rank of the individual in his class rather than by absolute values.

Satisfactory records were found in Birmingham for 303 migrant children, in Nashville for 184, and in Charleston for 75, a total of 562 cases.

Stating the average score in school marks for non-migrant children as 50, the score for Birmingham migrant children was found to be 44.8; that for Nashville children was 54.0; that for Charleston was 55.6; and that for the total group 49.3, or very close to the average for the non-migrants. The findings were practically the same with respect to age-grade status. Comparisons between records of northern migrants and those of migrants to other sections also gave results which were essentially negative. "This part of the study, therefore, gives no indication of a selective migration which might explain the superiority of northern over southern Negroes. There remains the problem of deciding whether a change in the environment of the Negro children could raise their intelligence-test level sufficiently to account for the observed difference."

The latter part of the investigation includes nine separate studies made under the direction of the author by Master of Arts candidates in the Department of Psychology in Columbia University. Various intelligence and performance tests were administered to a total of 3,081 subjects, consisting of ten- and twelve-year-old Negro boys and girls in Harlem schools. In analyzing the findings, the children were classified according to duration of residence in New York City. There is impressive consistency of the separate studies in the indication of direct association between intelligence test scores and length of residence in New York. The association was negligible insofar as the performance tests (such as form board and speed of movement tests) were concerned.

On the basis of the twofold sets of studies, the author concludes: "As far as the results go, they show quite definitely that the superiority of the northern over the southern Negroes, and the tendency of northern Negroes to approximate the scores of the Whites, are due to factors in

the environment, and not to selective migration." This conclusion is wisely guarded by a prefacing qualification. A more general statement would doubtless fail of general acceptance until the studies are carried further. In the reviewer's opinion, Dr. Klineberg's outstanding contribution, thus far, consists in his analysis of the nature of the problem and in the development of a technique, but not in conclusive results. In the first place, one wonders whether the negative results obtained in the investigation of migrants from Birmingham, Nashville, and Charleston would be the same if such studies were made in rural areas whence a large proportion of Negro migrants come. In regard to the New York studies, the published tables reveal some pitifully small numbers in the sub-groups after the essential classifications are made. Standard deviations are conscientiously presented, but these lend little weight even to "suggestive" interpretations when, as in one table (page 32) relating to country-born children, the numbers studied in five categories of city residence duration are 9, 9, 11, 7, and 4, respectively.

No one is more aware than the author of the limitations of his material and he well deserves our gratitude for pioneering work in a field beset with many difficulties but proportionately important.

CLYDE V. KISER

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NUTRITION AND PUBLIC HEALTH

"INSOFAR as public health activity is concerned not only to defend populations against disease, but also to create a maximum of physical well-being, nutrition is perhaps the most important subject with which it has to deal," say Et. Brunet and W. R. Aykroyd in their report entitled, "Nutrition and Public Health."[1] These authors have prepared a concise and lucid summary of present-day knowledge of foods and the science of nutrition and have made a survey of public health nutrition activities now carried on in many countries throughout the world, including the United States. Their report of 150 pages in the QUARTERLY BULLETIN of the Health Organization of the League of Nations deals briefly with many aspects of the whole problem of nutrition and is addressed primarily to public health officials. It includes a bibliography of 129 titles.

[1] Brunet, Et. and Aykroyd, W. R.: Nutrition and Public Health. *Quarterly Bulletin* of the Health Organization, League of Nations, June, 1935, iv, No. 2.

There is a discussion of the standards of human requirements for various food factors and of the various physical standards which have been used to assess the state of nutrition of the individual or to detect malnutrition. The lack of precision in these standards is admitted frankly but it is pointed out also that within certain limits they have great value for establishing a practical program. Examples of public education in nutrition and of many public health efforts in which nutrition work is coordinated with other activities, as in infant, maternity, and child health programs, are cited. Examples of public action range from preventive measures for specific dietary deficiency diseases to the collective feeding from kitchen-factories found in the U.S.S.R. The significant indication brought out is that if a high standard of health and efficiency for the general public is to be attained, there must be organized, systematic measures taken to insure an adequate diet.

The effect of national economic policies on the food supply of countries and the relation of nutrition to economic, agricultural, and industrial problems are given considerable emphasis in the report and these broader aspects of the problem are of especial interest. National planning and even world planning are suggested as possible for dealing with the broad problem of food production and distribution. Such planning "could not be formulated without taking into account the facts of food production as they at present exist, and its aim would be to bring about modifications and improvements in existing dietary habits rather than drastic alterations." In the authors' opinion, "production, distribution, and consumption have hitherto been considered mainly as economic phenomena without sufficient regard to their effect on public health"; and "the general problem of nutrition as it presents itself today, is that of harmonizing economic and public health development."

DOROTHY G. WIEHL

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AN INTRODUCTION TO PUBLIC HEALTH[1]

To many teachers and administrators in public health, this book by Dr. Mustard will be a pleasant surprise. In general scope, it shows similarity to other books on the principles of sanitary science and public

[1] Mustard, Harry S., M.D.: AN INTRODUCTION TO PUBLIC HEALTH. New York, Macmillan, 1935, 250 pp. ($2.50).

health practice. An inspection of its table of contents will reveal no striking departures from orthodox array of topics; the book is arranged in twelve chapters, treating the following subjects:

1. Backgrounds
2. Vital statistics
3. Organization and administration
4. Acute communicable diseases
5. Tuberculosis
6. Venereal diseases
7. Sanitation
8. Hygiene of the individual
9. Childbearing
10. Infancy and childhood
11. School health service
12. Non-communicable diseases

The sequence is not altogether that which has been followed by other textbook writers; but Dr. Mustard presumably follows the order which he has found useful in his own thinking and teaching. The elements which are novel and give distinction to this volume are of two other kinds.

First, Dr. Mustard takes as his initial benchmark the principle that public health, considered as one of many social measures, includes medical care. The relation between *public health* and *social betterment* which influences his thinking he summarizes as follows (pages 2-3):

> 1. As health is an essential factor in human welfare its maintenance and protection are necessarily of social importance.
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> 2. The extent and manner in which society concerns itself as to the public health depends upon the social philosophy which prevails.
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> 3. Under a system where individualism obtains, society tends to take only those public health measures which are beyond the scope of individual action: organization for the prevention and control of epidemics, the provision of public water supplies, sewer systems, milk sanitation.
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> 4. Since, for generations, the social philosophy in America was largely one of individualism, quite naturally public health work has been concerned with problems of the mass rather than of the individual.

> 5. Within recent years, society has shown an increasing tendency to assume responsibility for the individual as an individual: for his education, his employment, his general welfare.
>
> 6. Out of this evolution there has come a tendency to broaden and intensify public health work; and in this expansion, government, representing society, appears more and more inclined to regard provision of adequate public health and medical care as society's responsibility to each individual if he cannot himself procure such service.*

And later (pages 11-12): "A health problem becomes a public health responsibility if or when it is of such character or extent as to be amenable to solution only through systematized social action, its relative importance varying with the hazard to the population exposed. This risk may be qualitative, in terms of disability or death; quantitative, in terms of proportion of population affected; actual or potential."

Here are views deserving careful consideration. Nor are they expressed only *ex cathedra;* although the first chapter of the book devotes some fourteen pages to introduction and the formal history of public health, the next nine pages cover a review of medical service, its market, the supply, the demand, the costs, etc. Throughout all the succeeding text a strongly social viewpoint prevails and the relations of the public authority to the private practitioner are frequently brought to bear upon the analysis.

Second, the relative distribution of text in terms of subject matter follows not the well-established traditions for public health textbooks, but the actual practices of public health administration. The description of activities which have become well established and routinized is condensed and almost neglected. This is notably true of environmental sanitation and related topics. The subjects which have been made prominent by recent changes in the problems of public health practice are given most of the space—tuberculosis, the venereal diseases, hygiene of the individual, maternity and infancy care, etc. In this proper sense, the book is an introduction to *modern* public health.

Finally, Dr. Mustard has not forgotten his critical senses in any preoccupation with trying to write simply. Without adopting a cynical tone, he has managed to challenge many current views and to show the

*If this present tendency in government and society continues, and regardless of whether or not one is in accord with it, the organization for and administration of public health and medical care will undergo very definite changes.

student why both those who practise public health and those who pay for it have a right to ask why *this* is done or upon what evidence *that* rests. He has written frankly and without sophistry. His book warrants reading by public health workers and deserves trial by other public health teachers.

I. S. FALK

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PUBLIC HEALTH ADMINISTRATION IN THE UNITED STATES[1]

PUBLIC health administration is, at best, an art and not a science. A sound text on this subject must therefore rest as much upon experience as upon principles and must reflect the dynamic qualities of changing practices. Public health administration in the United States is primarily state and local rather than national, and its form is indigenous to the community. No single pattern prevails except in certain broad essentials; only an exhaustive survey could pretend to describe all or even many of the prevailing schemes and practices. Fortunately, Professor Smillie has not attempted this impossible task; he has tried only to set down the broad outlines of current practice and his own opinions on good practice or best practice. The strength of his position is that his text is definitive; its weakness, of course, is that there is no escape from the necessity of being somewhat dogmatic. Science prizes the art of being objective. Nevertheless, a book whose author is not afraid to use the word "should" comes as a refreshing breeze over the stream of more impersonal literature.

PUBLIC HEALTH ADMINISTRATION IN THE UNITED STATES is not a text on hygiene or preventive medicine. It treats, briefly, some of the elements of preventive medicine. But it is primarily, and almost uniquely, a book on *administration,* distinguishable from other recent volumes in this field by the fact it is the product of one person rather than of a group or committee. It is arranged in four parts: the first is introductory; the second deals with the administrative control of communicable diseases; the third treats the basic activities, the functions of a health organization (vital statistics, epidemiology, laboratory, public health nursing, sanitation and sanitary inspection, etc.); the fourth embraces the anatomy of

[1] Smillie, Wilson G., A.B., M.D., Dr.P.H.: PUBLIC HEALTH ADMINISTRATION IN THE UNITED STATES. New York, Macmillan, 1935, 458 pp. ($3.50).

organization (municipal, rural, state and federal, official and voluntary), appraisal of activities, training of personnel, budgets and budget making, and, especially interesting, the broad social philosophy in the purpose and the domain of public health practice.

It is beyond the compass of this review to set down all the comments and criticisms which come to mind when reading Professor Smillie's book. Five points will perhaps serve to give the flavor of the volume:

1. Public health administrative practice is described in its historical perspective. This runs through the text, chiefly from comparisons between the views of Lemuel Shattuck (and other American pioneers) and of present-day administrators. This reminds one of the practice which some of us have used in pointing to the stability of basic principles through a comparison of Shattuck's report of the middle of the last century and Sir George Newman's AN OUTLINE OF THE PRACTICE OF PREVENTIVE MEDICINE (1919). It is perhaps a pity that the author does not go back to the even earlier influences of the English liberals—the Earl of Shaftesbury, Chadwick and Simon, *et al.*, from whose work public health administration so clearly evolved as a consequence of the demonstrable relations between poverty and disease. This next step backward would round out the story and complete the circuit of argument, because the author comes to the end of his text when he arrives at the present-day issues over the relations of poverty to the private purchase of medical services.

2. Public health practice is presented as something which is dynamic and not static. The text soundly emphasizes the diversity of American conditions and practices and the variations in community needs. The influences which are at work now, principally through the stimulus of the American Public Health Association, tend to unify practices through the exchange of experience, thus breaking down insularity, without establishing too rigid standards.

3. Sound practice rests not upon the good intentions of the administrator but upon the critical evaluation of accomplishments. In this respect, the author has wisely chosen Dr. Chapin as his first guide. The volume could perhaps profit, even at the price of enlargement, by the more frequent inclusion of the actual evidence upon which the author's conclusions rest. As it is, the student may not always be aware when a judgment is supported by objective evidence.

4. Sound administrative practice requires not only organization, but

also trained personnel and sufficient money. On this score, the author's views generally rest on sound grounds everywhere except perhaps on the last. It seems extremely doubtful that the practices he recommends could be carried out anywhere with the budgets and personnel which are suggested variously as "minimum," "suitable," or (apparently) "adequate." Only under exceptional conditions can high standards of practice be attained with small staffs and low salaries. Liberalism in the outlook for skilled personnel is scarcely compatible with conservatism in financial support.

5. The lines which separate public health from public welfare, or public health from private practice, need definition. The author's views are apparently clear on the principles; perhaps in a later edition of the book he will amplify his views on the practices.

Professor Smillie is to be congratulated upon having produced a book from which many readers will profit.

I. S. Falk

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BOOKS RECEIVED

The Art of Public Health Nursing. By Edith S. Bryan, Ph.D., R.N. Philadelphia and London, W. B. Saunders Company, 1935. 296 pp. Price, $2.00.

A discussion of personal and professional ideals in the field of public health nursing by a former teacher at the University of Chicago.

Child Care and Training. (*Third Edition, Revised.*) By Marion L. Falgre and John E. Anderson. Minneapolis, The University of Minnesota Press, 1930. 276 pp. (*Illustrated*) Price, $2.00.

This book contains information and advice for parents and others who are concerned with the development and care of the normal child. Dr. Anderson is director of the Child Welfare Institute of the University of Minnesota, and Mrs. Falgre is an assistant professor of parental education.

Dermatology and Syphilology for Nurses Including Social Hygiene. (*Second Edition.*) By John H. Stokes, M.D. Philadelphia and London, W. B. Saunders Company, 1935. 368 pp. (*Illustrated*) Price, $2.75.

This book deals with the description and treatment of diseases of the

skin and of venereal diseases. There is also a discussion of principles of social hygiene and the background of the venereal disease problem.

DIET AND PHYSICAL EFFICIENCY. By Howard W. Haggard, M.D., and Leon A. Greenberg, Ph.D. New Haven, Yale University Press, 1935. 180 pp. (*Illustrated*) Price, $3.00.

A study of the influence of frequency of meals on physical efficiency and industrial productivity.

FREE MEDICAL CARE. DEBATERS HELP BOOK, VOL. II. Compiled and edited by E. C. Buehler. New York, Noble and Noble, Publishers, Inc., 1935. 360 pp. Price, $2.00.

This book contains a brief of the affirmative and negative arguments on the proposition: "Resolved: That the several states should enact legislation providing for a system of complete medical service available to all citizens at public expense"; a selection of articles on the subject which have previously been published, and a bibliography of books, pamphlets, and articles.

HEALTH BEHAVIOR. By Thomas D. Wood, M.D., and Marion Olive Lerrigo, Ph.D. Bloomington, Illinois, Public School Publishing Company, 1930. (Copyrighted 1927) 150 pp.

A manual of scales primarily for teachers and supervisors of health education, arranged for various age groups, designed for use in setting up objectives, planning courses of study, and applying methods for measuring results. Bound in with this book is a 32-page supplement by the same authors giving practical suggestions for administering health education programs.

PERSONAL AND COMMUNITY HEALTH. (*Fourth Edition.*) By Clair Elsmere Turner, M.A., Dr. P.H. St. Louis, The C. V. Mosby Company, 1935. 680 pp. (*With numerous illustrations, including four color plates*) Price, $3.00.

A comprehensive textbook for the various college-level groups. The author is professor of biology and public health in the Massachusetts Institute of Technology.

THE REBUILDING OF MANCHESTER. By Sir E. D. Simon, M.A., and J. Inman, B.A. London and New York, Longmans, Green and Co., 1935. 174 pp. (*With illustrations and maps*) Price, $2.00.

The former Lord Mayor of Manchester, England, chairman of the Man-

chester City Council's Housing Committee, and his collaborator, give a history of housing development in Manchester during the past hundred years, describe the "satellite garden town" Wythenshawe, and propose a broad program for slum clearance and better housing during the next fifty years.

SOCIALIZED MEDICINE. THE NINTH ANNUAL DEBATE HANDBOOK, 1935-1936. Edited by Bower Aly. Columbia, Missouri, Lucas Brothers Publishers, 1935. Vol. i, 224 pp.; vol. ii, 224 pp. Price, 75 cents per volume.

This handbook for debaters in high schools, colleges, and universities contains an analysis of the proposition: "Resolved: That the several states should enact legislation providing for a system of complete medical service available to all citizens at public expense"; and articles relating to this question either written especially for this book or reprinted from other publications.

TEACHERS' PROBLEMS IN HEALTH EDUCATION. BOOK I. TEACHING HOW TO GET AND USE HUMAN ENERGY. By Thomas D. Wood, M.D. and Marion O. Lerrigo, Ph.D. Bloomington, Illinois, Public School Publishing Company, 1928. 128 pp.

Designed for use in connection with HEALTH BEHAVIOR, listed above.